

C
Un 32u Zu H
1880/81

dhc

UNION UNIVERSITY.

UNION COLLEGE.

CIRCULAR AND CATALOGUE

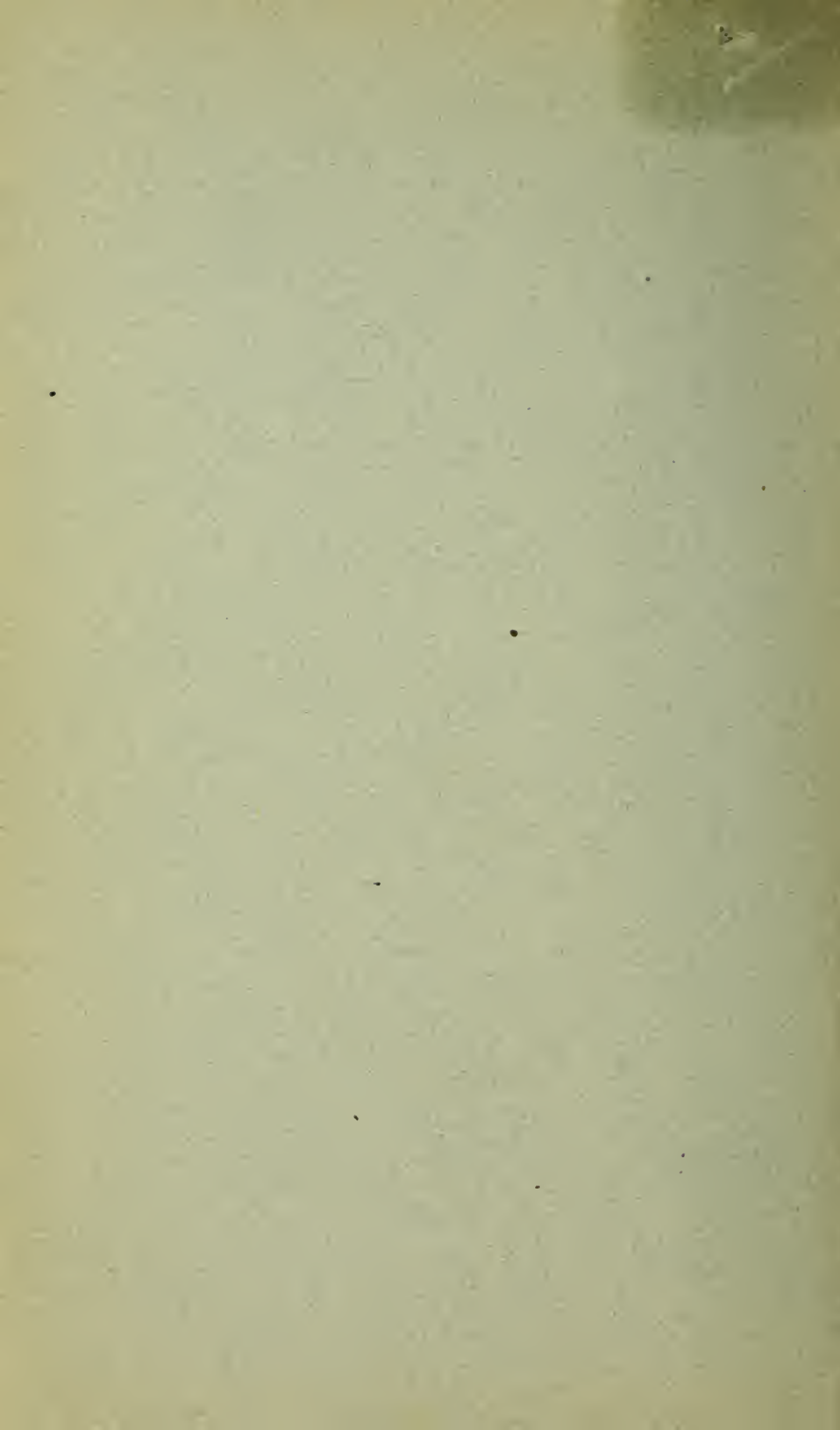
FOR

1880-81.

EIGHTY-SIXTH YEAR.



ALBANY:
CHARLES VAN BENTHUYSEN & SONS.
1881.



UNION UNIVERSITY.

UNION COLLEGE.

CIRCULAR AND CATALOGUE

FOR

1880-81.

EIGHTY-SIXTH YEAR.



ALBANY:
CHARLES VAN BENTHUYSEN & SONS.
1881.

C
Un 32uZuH
1880/81

UNION COLLEGE CALENDAR, 1881-82.

Winter Term, 1881, beginsWednesday, January 5.
“ “ ends.....Thursday, March 31.
Easter Vacation.
Spring Term begins.....Tuesday, April 5.
Commencement.....Wednesday, June 22.
 Baccalaureate Sermon.....Sunday, June 19.
 Phi Beta Kappa, Trustee, Alumni meetings ; Prize
 SpeakingTuesday, June 21
Vacation.
Entrance Examinations.....Thursday, Friday, June 23, 24.
“ “Monday, Tuesday, September 12, 13.
Fall Term begins.....Wednesday, September 14,
Recessat Thanksgiving ; 5 days.
Fall Term endsThursday, December 22,
Christmas Vacation.
Winter Term, 1882, beginsThursday, Jan. 5.
Recess.....Prayer-day for Colleges,
“Washington's Birthday,
Winter Term ends.....Thursday, March 30.
Recess.....Good Friday,
Spring Term begins.....Thursday, April 6,
Commencement.....Wednesday, June 28.
 Baccalaureate Sermon.....Sunday, June 25,
 Phi Beta Kappa, Trustee, Alumni meetings ; Prize
 SpeakingTuesday, June 27.
Vacation.
Entrance Examinations.....Thursday, Friday, June 29, 30.
“ “Monday, Tuesday, September 18, 19.
Fall Term begins.....Wednesday, September 20.
Recess.....at Thanksgiving ; 5 days.
Fall Term ends.....Friday, December 22.

UNION UNIVERSITY.

Union University embraces the several institutions of Union College, the Albany Medical College, the Albany Law School and the Dudley Observatory.

Union College was incorporated by the Regents of the University of the State of New York on the 25th day of February, 1795. It was the first college incorporated by them, the first founded in this State north of the city of New York and west of the Hudson river, the first chartered after the establishment of the United States and the first not of a strictly denominational character. It received its name from the circumstance that several religious denominations coöperated in founding it, and it has continued to be the representative institution of Christian unity.

Union College acquired by its charter full university powers, but the creation of post-graduate institutions at Schenectady was not found practicable. Schools of Law and Medicine and also an Astronomical Observatory had long existed at Albany, the distance between which city and Schenectady, estimated in time, is less than that which in many cases separates the professional schools from other university departments. The arrangement naturally suggested by these circumstances was that the professional Schools and the Observatory at Albany should be united with Union College. Permanent Trustees of Union College are members of the University Board of Governors, and the President of the College has the oversight of the University and of its several institutions; each of these institutions having its resident Dean, who acts for the President during his absence or temporary disability.

The union of the several institutions was consummated A. D. 1873 by the incorporation of Union University.

OFFICERS OF UNION UNIVERSITY.

PRESIDENT.

ELIPHALET NOTT POTTER, D. D., LL. D.

GOVERNORS.

THOMAS HUN, LL. D.,
HON. AMASA J. PARKER, LL. D.,
ROBERT H. PRUYN, LL. D.,
HENRY H. MARTIN, Esq.,
ORLANDO MEADS, LL. D.,
HON. WM. L. LEARNED, LL. D.

PERMANENT TRUSTEES OF UNION COLLEGE are also members of the
Board of Governors.

TRUSTEES OF UNION COLLEGE.

Ex Officio.	{	HIS EXCELLENCY ALONZO B. CORNELL, Governor,
		HON. GEORGE G. HOSKINS, Lieut. Governor,
		HON. JOSEPH B. CARR, Secretary of State,
		HON. JAMES W. WADSWORTH, Comptroller,
		HON. NATHAN D. WENDELL, Treasurer,
Also Governors of University.	{	HON. HAMILTON WARD, Attorney-General,
		HON. WILLIAM W. CAMPBELL, LL. D.,
		REV. EBENEZER HALLEY, D. D.,
		REV. J. TRUMBULL BACKUS, D. D., LL. D.,
		HON. CLARKSON N. POTTER, LL. D.,
		HON. PLATT POTTER, LL. D.,
		HON. CHARLES C. NOTT,
		WILLIAM TRACY, LL. D.,
		ELIPHALET NOTT POTTER, D. D., LL. D.,
		JOSEPH W. FULLER, Esq.,
		SILAS B. BROWNELL, Esq.,
		GEN. FREDERICK TOWNSEND,
REV. WILLIAM IRVIN, D. D.,		
HON. JUDSON S. LANDON,		
HON. EDWARD W. PAIGE,		
REV. J. LIVINGSTON REESE, D. D.		

ROBERT H. McCLELLAN, Esq.,	term of office expiring	June 1881,
AMASA J. PARKER, Jr., Esq.	"	" 1882,
DAVID C. ROBINSON, Esq.,	"	" 1883,
THOMAS H. FREAREY, Esq.,	"	" 1884.

JONATHAN PEARSON, Treasurer.

EDGAR M. JENKINS, Assistant Treasurer and Secretary.

CHANCELLORS.

HON. ALEXANDER H. RICE, LL. D., 1881,
 HON. JOHN WELSH, LL. D., 1880,
 HON. JOHN K. PORTER, LL. D., 1879,
 HON. WM. PORCHER MILES, LL. D., 1878,
 HON. GEORGE WILLIAM CURTIS, LL. D., 1877,
 RT. HON. WILLIAM E. GLADSTONE, D. C. L., 1876,
 RT. REV. HORATIO POTTER, D. D., LL. D., D. C. L., 1875,
 HON. JOHN A. DIX, LL. D., 1874,
 HON. HORATIO SEYMOUR, LL. D., 1873,
 ELIPHALET N. POTTER, D. D., LL. D.

CURATORS

OF THE LIBRARY AND OF BUILDINGS AND PARKS OF UNION COLLEGE.

PRESIDENT POTTER,	THEODORE IRWIN, Esq.,
J. TRUMBULL BACKUS, D. D., LL. D.,	HON. FRED. W. SEWARD, LL. D.,
HOWARD POTTER, Esq.,	HON. SAMUEL BLATCHFORD, LL. D.,
JOHN HOBART WARREN, Esq.,	CORNELIUS VANDERBILT, Esq.,
HON. SAMUEL T. BENEDICT,	ROBERT LENOX KENNEDY, Esq.,
WM. H. H. MOORE, Esq.,	JOHN CROSBY BROWN, Esq.,
HENRY C. POTTER, D. D., LL. D.,	GEO. HUNTER BROWN, Esq.

CURATORS OF THE LEVI PARSONS SCHOLARSHIPS FUND.

HON. LEVI PARSONS, Hon. GEORGE YOST,
 The RECTOR OF ST. JOHN'S CHURCH, Johnstown, N. Y.

VISITORS OF THE NOTT TRUST FUND.

URANIA E. NOTT,	Rev. WILLIAM PAYNE, D. D.,
HON. W. W. CAMPBELL, LL. D.,	Rev. WILLIAM E. GRIFFIS,
Rev. TIMOTHY G. DARLING, D. D.,	Rev. WM. S. SMART, D. D.

VISITORS OF THE WHEATLEY COLLECTION.

Rev. J. TRUMBULL BACKUS, D. D., LL. D., JOHN S. DELAVAN, M. D.,
 ALBION RANSOM, Esq., CHARLES W. WHEATLEY, Esq.
 Custodian, Prof. MAURICE PERKINS, M. D.

FACULTY.

UNION COLLEGE.

ELIPHALET NOTT POTTER, D. D., LL. D., President;
Lectures and Instruction in Moral Philosophy, Christian Evidences
and the Constitution of the United States.

JOHN FOSTER, LL. D.,
Nott Professor (No. 8) of Natural Philosophy.

JONATHAN PEARSON, A. M.,
Professor of Agriculture and Botany.

HENRY WHITEHORNE, A. M.,
Nott Professor (No. 1) of the Greek Language and Literature.

WILLIAM WELLS, LL. D.,
Professor of Modern Languages and Literature.

MAURICE PERKINS, A. M., M. D.,
Nott Professor (No. 3) of Analytical Chemistry and Curator of the
Museum.

CADY STALEY, A. M., C. E., Dean;
Professor of Civil Engineering.

HARISON E. WEBSTER, A. M.,
Professor of Natural History.

ISAIAH B. PRICE, C. E.,
Professor of Mathematics and Adjunct Professor of Physics.

REV. GEORGE ALEXANDER, A. M.,
Professor of Logic and Rhetoric.

REV. TIMOTHY GRENVILLE DARLING, D. D.,
Acting Professor of Mental Philosophy and Hebrew.

WENDELL LAMOROUX, A. M.,
English Essays and Oratory, and Assistant Librarian.

REV. GEORGE W. DEAN, S. T. D.,
Professor of Latin.

REV. EGBERT C. LAWRENCE,
Assistant Professor of History.

MAJOR J. W. McMURRAY, A. M., U. S. A.,

Professor of Military Science and Tactics.

CHARLES W. VANDERVEER,

Instructor in Physical Culture.

JAMES E. BENEDICT,

Assistant in Zoölogy.

SAMUEL B. HOWE, A. M.,

Adjunct Nott Professor (No. 4), Principal of Union School and Superintendent of the Schools of Schenectady.

REV. PHILLIPS BROOKS,

Baccalaureate Sermon, 1881.

HENRY COPPEE, LL. D.,

Professor of History, English Literature and Philology.

REV. EDWARD A. WASHBURN, D. D.,

Lectures on Old English and on Art.

PROF. ROSWELL D. HITCHCOCK, D. D.,

Lectures on Christian Socialism.

HON. S. T. BENEDICT,

Lectures on Law.

E. D. PALMER, A. M.,

Sculpture.

WILLIAM A. POTTER, A. M.,

Professor of Architecture.

HON. DAVID MURRAY, LL. D.,

Lectures on Oriental Civilization.

REV. WILLIAM E. GRIFFIS,

Lectures on Oriental Art.

REV. J. L. PARKS,

Lectures on Self-culture.

PROF. IRVING BROWNE,

Lectures on Shakespeare.

The gentlemen whose names follow the Faculty list are not permanently in residence at the College. Several of them give instruction by text-book as well as by occasional lectures or other methods.

COLLEGE OFFICERS.

JONATHAN PEARSON, A. M.,

Treasurer and Librarian.

EDGAR M. JENKINS, Esq.,

Assistant Treasurer and Registrar.

~~~~~  
Superintendent of Buildings and Farm,  
JAMES PICKETT.

College Bindery.

D. D. TELLER, Binder,

HENRY TRIPP, Assistant; and Photographer.

---

## DEPARTMENT OF MEDICINE.

### ALBANY MEDICAL COLLEGE.

PRESIDENT POTTER,

President of the Faculty.

THOMAS HUN, M. D., Dean;

Emeritus Professor of the Institutes of Medicine.

S. O. VANDER POEL, M. D., LL. D.,

Professor of Pathology, Practice and Clinical Medicine.

ALBERT VANDERVEER, M. D.,

Professor of the Principles and Practice of Surgery, and Clinical Surgery.

JACOB S. MOSHER, M. D., Ph. D., Registrar;

Professor of Medical Jurisprudence and Hygiene.

MAURICE PERKINS, M. D.,

Professor of Chemical Philosophy and Organic Chemistry.

JOHN M. BIGELOW, M. D.,

Professor of Materia Medica and Therapeutics.

LEWIS BALCH, M. D.,

Professor of Anatomy.

SAMUEL B. WARD, M. D.,

Professor of Surgical Pathology, Operative and Clinical Surgery.

JOHN P. GRAY, M. D., LL. D.,

Professor of Psychological Medicine.

JAMES P. BOYD, JR., M. D.,

Professor of Obstetrics and Diseases of Women and Children.

WILLIS G. TUCKER, M. D.,

Professor of Inorganic and Analytical Chemistry.

—WILLIAM HAILES, M. D.,

Anthony Professor of Histology and Pathological Anatomy.

*FACULTY—LAW SCHOOL.*

CYRUS S. MERRILL, M. D.,

Professor of Ophthalmology.

S. O. VANDER POEL, JR., M. D.,

Adjunct Professor of Pathology, Practice and Clinical Medicine.

FRANKLIN TOWNSEND, M. D.,

Lecturer on Physiology.

F. C. CURTIS, M. D.,

Adjunct Professor of Dermatology.

HENRY MARCH, M. D.,

Curator of the Museum.

EUGENE VAN SLYKE, M. D.,

Demonstrator of Anatomy.

## DEPARTMENT OF LAW.

## ALBANY LAW SCHOOL.

PRESIDENT POTTER,

Feudalism and Constitutional Law.

HON. WILLIAM L. LEARNED, LL. D.,

Civil Law and Equity Jurisprudence.

HON. HORACE E. SMITH, LL. D., Dean ;

Personal Property, Contracts, Commercial Law and Torts.

HON. MATTHEW HALE,

Criminal Law and Personal Rights.

HENRY COPPEE, LL. D.,

International Law.

H. E. SICKELS, Esq.,

Sources of the Common Law, and the Law of Evidence.

CHARLES T. F. SPOOR, Esq.,

Practice and Pleading at Common Law and under the Code.

HENRY S. McCALL, Esq.,

Real Property, Wills, and Practice in Surrogate's Courts.

IRVING BROWNE, Esq.,

Domestic Relations.

## DUDLEY OBSERVATORY.

PRESIDENT POTTER. .

LEWIS BOSS, A. M.,  
Director and Dean.

T. DECUE PALMER, C. E.,  
RICHARD H. TUCKER, JR., C. E.,  
MILTON G. POND, A. B.,  
WM. P. THORNTON, A. B.,

Assistant Astronomers.

JOSEPH McGOUGH,  
Janitor.





UNION COLLEGE.

# DONORS TO UNION COLLEGE, 1879-80.

---

(FROM THE ANNUAL REPORT OF THE TREASURER).

The gifts received by the Treasurer have been as follows :

## Through PRESIDENT POTTER :

|                                                                                                |         |
|------------------------------------------------------------------------------------------------|---------|
| MISS CATHARINE L. WOLFE.....                                                                   | \$4,000 |
| ROBT. LENOX KENNEDY, Esq.....                                                                  | 1,000   |
| HON. THOS. A. SCOTT.....                                                                       | 1,000   |
| MRS. THOS. H. POWERS.....                                                                      | 10,000  |
| JOSEPH W. FULLER, Esq., balance of \$1,000.....                                                | 900     |
| JOHN S. PERRY, Esq., note.....                                                                 | 1,000   |
| From estate of Hon. WM. F. ALLEN, LL. D., interest.....                                        | 144     |
| ROBT. A. PACKER, Esq., interest-bearing promise.....                                           | 5,000   |
| HARRY E. PACKER, Esq., interest-bearing promise.....                                           | 5,000   |
| JOHN H. VAN ANTWERP, Esq., interest-bearing promise.....                                       | 1,000   |
| In sums smaller than \$1,000.....                                                              | 2,500   |
| Sums smaller than \$1,000, received as above since May 30th, 1880.....                         | 2,500   |
| THEODORE IRWIN, Esq., interest-bearing promise..                                               | 1,000   |
| ASA WHITNEY Memorial, by SONS OF ASA WHITNEY.....                                              | 1,000   |
| MRS. IVES GAMMELL.....                                                                         | 1,000   |
| MISS ELLEN MASON, }                                                                            | 5,000   |
| MISS IDA MASON, }                                                                              |         |
| MRS. ALEXANDER BROWN, London, Eng. (in addition to sums in previous Reports of Treasurer)..... | 8,000   |

## Scholarship Donations :

|                                           |        |
|-------------------------------------------|--------|
| MISS CATHARINE L. WOLFE (previously)..... | 50,000 |
| HON. LEVI PARSONS.....                    | 50,000 |

## The CENTURY CLUB :

|                                                           |       |
|-----------------------------------------------------------|-------|
| Amount devoted principally to stipends of Professors..... | 3,500 |
|-----------------------------------------------------------|-------|

## DEPARTMENTS OF INSTRUCTION.

---

### THE GREEK LANGUAGE AND LITERATURE.

The course of instruction in this department extends through the Freshman and the Sophomore year and the first and second term of the Junior. The object kept constantly in view throughout the course is not merely to teach so many works of an unknown tongue but to instruct and educate the pupil by a system of mental training grounded upon the works of the most noble poets, dramatists, historians and philosophers of the ancient world. To this end the pupil is taught not only to translate into accurate and idiomatic English, to analyze with great care the grammatical construction and to compare it with that of his own tongue, but especially to obtain a thorough knowledge and critical appreciation of the authors selected for his use.

Although there must be a general uniformity in the order in which different authors are read, yet no particular works are assigned to the several terms. The proficiency of each class determines the character of the book to be read.

### THE LATIN LANGUAGE AND LITERATURE.

The course of teaching in this department during the Freshman and the Sophomore year and the first and second term of the Junior takes in so much of the better Latin classics (in prose and poetry) and so much practice of Latin writing as the time will allow to be well done. It is aimed to acquaint growing minds with the highest and strongest thought and with the most beautiful and finished expression of Roman men of genius and education, and to familiarize the student with the structure and capabilities of a language which, if in some respects inferior, is also in some respects superior, to our own. The study is illustrated by the history and topography directly involved and by the reli-

gion, polity, science and warfare of nations as well as by the character and achievements of individuals. Light is thrown upon the Roman Language and Literature from our own while in turn our own authors and their works are illustrated by those of Rome. The course is graduated for the several years and although nearly uniform in amount is varied according to the proficiency of different classes.

#### MODERN LANGUAGES.

The Modern Languages supply the linguistic training of the Scientific course and are regular daily studies during the Freshman and Sophomore years and two terms of the Junior year; one hour a day being given to each class, and the studies alternating according to the schedule. Instruction is imparted by exercises in translation (written and oral), conversational practice, and familiar lectures on the standard authors read.

The French Language is a regular study through six terms, beginning with the first term Freshman. The text-book mainly used is Pujol's Complete French Course. At a later period classical and contemporary French Literature are read.

The study of the German Language commences with the first term Sophomore. The text-books are Comfort's Grammar, Whitney's Reader and the poets Schiller and Goethe.

The Italian and Spanish languages are voluntary studies, and classes are formed only when the demand is sufficient to justify them.

In addition to the text-books mentioned, are recommended Spiers and Surene's French Pronouncing Dictionary, Adler's German and English Dictionary.

The recitations in the Modern Languages are so arranged, when practicable, that they may also be taken by regular classical students.

#### LOGIC, RHETORIC AND ENGLISH LANGUAGE AND LITERATURE.

Hart's "Composition and Rhetoric" is used during Freshman year; Hill's "Principles of Rhetoric" and Clark's "Elements of

the English Language," with Chaucer's Prologue, etc., during Sophomore year; and Macbeth and other Shakespearian dramas receive critical study in the Senior year. Logic is pursued through the first Junior term.

In the study of English Literature, it is the aim to secure an acquaintance with the historical development of the language and with the course of English thought as expressed at different periods in the works of representative men.

The instruction in Logic and Rhetoric includes the use of text-books, lectures and practical exercises in oratory and the various forms of essay.

#### HISTORY AND POLITICAL ECONOMY.

It is purposed to give the student a knowledge of the events and philosophy of history by both lectures and recitations. In the department of Political Economy, he is taught the fundamental principles, prominent theories and practical issues of the subject and thus is prepared for the intelligent prosecution of the study.

#### MENTAL AND MORAL SCIENCE.

The elements and history of Mental and Moral Science are taught by the use of text-books, with oral explanations and illustrations. The effort is also made to give the student a knowledge of the present position of these sciences, the nature and value of their problems and modes of reasoning and thus to prepare him for intelligent investigation.

#### RELIGIOUS AND BIBLICAL INSTRUCTION.

During the Senior year, instruction will be given by the President or others upon the Claims and Evidences of Revealed Religion, upon Natural Theology and Christian Ethics. The religious teaching, while distinctly and earnestly Christian, is not denominational; but, as heretofore, is consistent with the design and chartered title of the College as the representative institution of the principles of Christian Unity. Members of the Faculty and others conduct Bible classes and exercise definite Christian influence upon the students, who also have a Theological Society and

other religious associations. Service is held in the College Chapel, every week-day morning.

#### GENERAL CULTURE AND ART INSTRUCTION.

This department, sustained by the generous benefactress who endowed the John David Wolfe Memorial Scholarships Foundation, aims in connection with the regular College courses to furnish to the student such instruction and practice in Belles Lettres and Art as will contribute to his general culture; and to furnish to the Art student the principles, methods and practice of his specialty.

It is intended to furnish lectures and other instruction in History, Literature and Language; on Methods of Study, on the Principles of Criticism in Art, on Self-culture, Social and Practical Life and similar subjects.

All the students in College are required to present Essays and Oratorical exercises during nearly the whole course. The Essays are criticised on the margin as to quality of thought, concentration and method, as to clearness, strength and harmony of style and as to grammar, spelling and punctuation. They are corrected by the student and returned to the Professor. The student is informed regarding the mental tendencies evinced in his essays and is advised as to the reading and form of self-culture particularly adapted to his needs.

Students desiring Modern Languages but unable to attend the regular classes may pursue these studies in this Department.

Direction and help are given toward methodic reading and investigation in any line of Literature.

A free Reading Room is kept open all day. It is supplied with periodicals and newspapers, native and foreign, and with works of reference.

Practice is afforded in Free-hand Drawing. Seniors have the privilege of visits to the studio of E. D. Palmer, A. M., with explanations and illustrations of the processes of sculpture by the artist.

It is purposed, on receiving the necessary endowment, to com-



plete the present arrangements for an Art Collection and professional services and thus greatly increase their usefulness.

The Department is under the charge of Professor Lamoroux.

#### MATHEMATICS.

The course in Mathematics is arranged with special reference to the disciplinary advantages which such studies afford. At the same time their practical uses are made plain by numerous examples, illustrations, and applications. In addition to the regular course, voluntary classes are formed in Analytic Geometry, Plane and Solid, and in the Calculus of Quaternions.

#### NATURAL PHILOSOPHY AND ASTRONOMY.

The instruction in this department begins with the first term of the Junior year. Students in the Academical department both of the Classical and the Scientific course and those in the Engineering department recite in two divisions (one hour being given to each division) four days in the week.

To secure at once precision and fullness, the instruction is mainly given from recently prepared text-books. Frequent lectures are however delivered either to furnish illustration and proofs of principles by experiment or to amplify particular subjects. Thus, after the completion of Statics and Dynamics, several lectures are devoted to mechanical "work" in order that not only the construction and theory, but modes of determining the efficiency, of the various hydraulic and pneumatic machines may be understood. All lectures are required to be written out by the students in full from the notes and submitted for inspection. Numerous problems are also given on all the subjects and are mostly so constructed that the calculated results may be verified by experiments before the class. To test the accuracy of the knowledge gained and to ensure its ready command, several written examinations are required in each term.

For the demonstration and illustration of the laws of Mechanics and Physics, an extensive cabinet of apparatus has been obtained from the workshops of this country and largely from those of London, Paris, and Munich. Some of these pieces may be specified.



Measurements.—French measures. Velocimeter for finding the number of revolutions of an axle. Dividing engine by Bianchi. Regnault's chronograph with tuning-forks and clock for measuring time to a small fraction of a second.

Mechanics.—Models of gridiron, mercurial and of Kater's reversible pendulum, of anchor and of spring escapements. Large table bearing illustrations of the modes of transmitting and transforming motions. Apparatus of Bourdon for showing the vis viva in a projectile. Complete apparatus for capillarity, including Simon's. Plateau's apparatus complete. Three models of the Turbine wheel. Very complete apparatus by W. and L. E. Gurfley for efflux of liquids under different heads, through orifices of various shapes and through straight or bent tubes.

Heat.—Walferdin's maximum and minimum and Breguet's metallic thermometers. Regnault's apparatus for finding co-efficients of dilatation of gases. Another for same under constant pressure and also under constant volume. Hypsometer of Regnault. Apparatus complete of Botigny for spheroidal state of liquids. Apparatus complete of Regnault for determining tension of the vapor of liquids from their boiling points under varying pressures. Apparatus of Gay Lussac and of Dumas for measuring the density of vapors. Ritchie's apparatus for finding ratio between the emissive and absorbent powers. Complete apparatus of Melloni for the laws of reflection, refraction, diffusion, diathermancy, absorption and polarization of heat. Complete apparatus of Favre and Silbermann for determining the heat from combustion. Pouillet's pyrheliometer.

Electricity and Magnetism.—Machines of Holtz and of Carré. Three induction coils, one giving spark of seventeen inches. Weber's grand galvanometer with telescope and scale. Thompson's reflecting galvanometer and his divided ring electrometer. Planté's secondary pile. Alliance magneto-electrical machine. Tyndall's electro-magnet for diamagnetism, rotation of polarized ray etc. Delezenne's circle. Wheatstone's bridge. Standard B. A. unit or ohm, tested at Kew. Set of resistance-coils. Jamin's large magnet, lifting nearly two hundred pounds. Large

magnetic theodolite of Lamont for declination and absolute intensity.

Acoustics.—Wave apparatus, including Wheatstone's. Large bellows, with full set of organ pipes. Sets of plates for vibrations. Melde's, Lissajou's and Crova's apparatus.

Light.—Electric lamp of Foucault. Large size of Silbermann's heliostat. Apparatus for diffraction and interference. Large four-prism spectroscope of Steinheil. Stoke's apparatus for fluorescence. Polyprism. Prisms of Senarmont, Hartnack, Rochon and Silbermann. Prism in spar of Dessains. Phosphoscope of Becquerel. Apparatus of Jamin for interference. Optic circle complete of Jamin. Polariscopes of Norremberg with polarizing microscope. Duboscq's apparatus for projecting phenomena of double refraction and polarization. Biot's apparatus complete for rotatory polarization, including Soleil's saccharometer, Foucault's photometer etc.

### CHEMISTRY.

In the undergraduate department, Chemistry is taught by daily lectures and recitations during the third Sophomore term and the first and the second Junior term.

There has recently been established a regular daily two-hours course of experimental Chemistry at the Laboratory.

The Nott Laboratory is open in all branches of Chemistry for special students; especially for students of Agriculture or Medicine, Pharmaceutists, Manufacturing Chemists, Mineralogists, Metallurgists, students of Medical Jurisprudence etc.

Those who desire to devote but a portion of their time to Chemistry can pursue other studies in the Collegiate course. No previous knowledge of the science is required, though it is highly desirable.

The course includes instruction in Theoretical and Experimental Chemistry and systematic Qualitative and Quantitative Analysis, in all their branches and in their application to the arts and manufactures.

## TEXT-BOOKS AND BOOKS OF REFERENCE.

|                                        |                                                        |
|----------------------------------------|--------------------------------------------------------|
| Cooke's Chemistry.                     | Knapp's Chemical Technology.                           |
| Craft's Qualitative Chemical Analysis. | Dana's Mineralogy.                                     |
| Fresenius's Analysis.                  | Gmelin's Hand-Book of Chemistry.                       |
| Cooke's Chemical Physics.              | Muspratt's Chemistry applied to Arts and Manufactures. |
| Miller's Chemical Physics.             | Lehmann's Physiological Chemistry.                     |
| Miller's Elements of Chemistry.        | Regnault's <i>Eléments de Chimie</i> .                 |
| Dalton's Physiology.                   |                                                        |
| Percy's Metallurgy.                    |                                                        |

The fees for full course of special instruction in the Laboratory are \$35 per term; for half-day course, \$25 per term; two-hours course, \$10 per term; a deposit of \$15 for materials etc. being required in the two first-mentioned courses, and one of \$10 in the last; the amount not consumed being returned. The expenditure varies from \$2 to \$20 a term.

For fuller information, address Prof. Maurice Perkins, M. D.

## NATURAL HISTORY.

PHYSIOLOGY is taught in the second Junior term to the whole class by recitations and by lectures on Comparative Anatomy and Physiology. The subjects are illustrated by preparations and dissections.

ZOOLOGY is taught during the third Junior term to the whole class by recitations and lectures. The work is illustrated by dissections and constant exhibition of specimens in the class-room. The Museum surpasses in some of its departments any other in this country.

GEOLOGY is taught during the first term of Senior year by a daily course of recitations and lectures.

MINERALOGY is taught during the second term by a course of practical lessons illustrated by a complete set of models of crystals and series of six hundred specimens for determination by crystallographic and blowpipe examination.

The facilities for instruction in these departments have been largely increased by the addition to the College Cabinet of the Wheatley Collection of Minerals and Shells purchased by E. C.

Delavan, Esq., for ten thousand dollars and presented by him to the College.

BOTANY is taught during the Summer term both from text-book (Gray's) and practically in the field.

#### THE LIBRARY.

contains about twenty thousand titles and has recently undergone re-classification and cataloguing on the best methods known to librarians.

There are also two good libraries belonging to the Literary Societies.

#### DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

Bvt. Major J. W. McMurray, U. S. A., Commandant and Military Instructor.

Mr. Chas. W. Vanderveer, Gymnast in charge of Gymnasium.

Military instruction and physical culture are provided for by the following regulations of the board of trustees: "All able-bodied students will be expected to attend exercises in the Military Department of the College with the following exceptions: Any Senior or Junior may elect at the beginning of the term to take instead, physical culture three times per week and history in two apportionments per week. Sophomores and Freshmen may in special cases be permitted by the Military professor and the Faculty to take instead such physical culture and study of history as shall be determined by the Faculty.

Work in the Military Department shall count as other work in the College and each student shall be credited therefor; and neglect of attendance or instruction shall debar the student from the privileges of the College the same as neglect of any other studies or duties."

Instruction in the Military Department consists of drill in the school of the soldier, company and battalion skirmish-drill, target practice, military signaling, military surveying, field fortification, organization of volunteers and militia under the United States laws for service under the General Government, organization of "Supply Departments" of the United States, customs of the military service

and other military instruction profitable to college graduates in the emergency of a war.

Students are organized into Companies at the beginning of the year for instruction.

The Cadet uniform is less expensive than civilians' dress, costing about \$15 complete; and being very neat, it may be worn at all times. It consists of a dark blue sack-coat, dark blue trousers and cadet cap with the letters U. C. in silver in front.

A well-equipped gymnasium and two bowling-alleys are open daily from 8 A. M. to 5 P. M. and on Tuesdays and Thursdays from 7 to 9 P. M.

Any student who is physically disabled may be excused on the certificate of the College physician, approved by the Faculty.

---

## COURSES OF STUDY.

---

### 1. CLASSICAL COURSE.

This is the usual baccalaureate course. Students may pursue additional studies in other courses. Some senior studies may be exchanged on consent of the Faculty for Elective studies.

### 2. SCIENTIFIC COURSE.

The modern languages are here substituted for the ancient, and the amount of mathematical and English studies is increased. Latin or Greek of the Classical course may be substituted, on consent of the Faculty, for French or German of the Scientific. Some senior studies may be exchanged on consent of the Faculty for Elective studies.

### 3. ENGINEERING COURSE.

The instruction and practice given qualify the student for immediate usefulness in the field and office and, after a moderate amount of experience, for the higher positions in the profession. On satisfactory examination he receives the degree of Civil Engineer (C. E.).



## 4. COURSE IN ANALYTICAL CHEMISTRY.

This course includes Theoretical and Experimental Chemistry, Systematic Qualitative and Quantitative Analysis, and their applications to Medicine, Manufactures, Agriculture, Mineralogy, Metallurgy etc. It provides special work in the Laboratory.

## 5. ECLECTIC COURSE.

Any studies in the preceding courses, making a proper amount of class work, may be taken by those found qualified to pursue them. A Certificate of Attainment is given.

## 6. COURSE IN NATURAL HISTORY.

The regular course includes Physiology, Zoölogy and Geology. Further studies may be pursued gratuitously.

## 7. AGRICULTURE.

Instruction is given in Agriculture, Botany etc. without extra charge. The College possesses an extensive garden and farm.

## ASTRONOMICAL OBSERVATION.

Astronomical and Meteorological observations are regularly made at the Dudley Observatory. The apparatus is large and rare. Instruction is given to special students.

## 9. PHYSICAL TRAINING AND MILITARY INSTRUCTION.

This course is under the charge of an officer of the Army and of an Instructor in Physical Culture. Seniors and Juniors may, at the beginning of the term, elect History in two apportionments per week, instead of exercises in the Military Department. Sophomores and Freshmen may in special cases be permitted by the Military Professor and the Faculty to take instead such physical culture and History as may be determined by the Faculty.

The Gymnasium and bowling-alleys are open daily from 8 A. M. to 5 P. M. and on Tuesdays and Thursdays from 7 to 9 P. M.



Substitution of a study in one Course for a study in another may be allowed by the Faculty on written application from the student through the President.



## ORDER AND PROPORTION OF STUDIES.

## CLASSICAL COURSE.

## FRESHMAN CLASS.

## FIRST TERM.

Hours  
a-week.

- 5 Livy.  
 4 Xenophon, Homer.  
 5 Algebra, continued to Series... Bourdon.  
   Greek prose composition.  
   Latin prose composition.  
 1 English... Hart.

## SECOND TERM.

- 4 Livy, Horace.  
 5 Xenophon, Homer, Herodotus.  
 5 Algebra, completed... Bourdon.  
   Greek prose composition.  
   Latin prose composition.  
 1 English... Hart.

## THIRD TERM.

- 4 Horace, Cicero.  
 4 Xenophon, Herodotus, Euripides.  
 3 Geometry — Books VI to IX... Legendre.  
 3 Trigonometry... Price.  
 1 English... Hart.  
   Greek prose composition.  
   Latin prose composition.  
 English Essay in the third term.  
 Military Drill three times a week, each term.

## ORDER AND PROPORTION OF STUDIES.

## SCIENTIFIC COURSE.

## FRESHMAN CLASS.

## FIRST TERM.

Hours  
a-week.

|   |                                  |          |
|---|----------------------------------|----------|
| 5 | Latin or English.                |          |
| 5 | French Grammar.....              | Pujol.   |
| 5 | Algebra continued to Series..... | Bourdon. |

## SECOND TERM.

|   |                                 |          |
|---|---------------------------------|----------|
| 3 | Latin or English.               |          |
| 5 | French Grammar and Reader ..... | Pujol.   |
| 2 | Drawing.                        |          |
| 5 | Algebra completed.....          | Bourdon. |

## THIRD TERM.

|   |                                 |           |
|---|---------------------------------|-----------|
| 5 | French Grammar and Reader ..... | Pujol.    |
| 3 | Geometry — Books VI to IX.....  | Legendre. |
| 4 | English.                        |           |
| 3 | Trigonometry.....               | Price.    |

English Essay in the third term.

Military Drill three times a week, each term.

## SOPHOMORE CLASS.

## Classical Course.

## FIRST TERM.

Hours  
a-week.

- |   |                          |                       |
|---|--------------------------|-----------------------|
| 4 | Tacitus, Horace.         |                       |
| 5 | Euripides, Æschylus.     |                       |
| 3 | Rhetoric.....            | Hill.                 |
| 3 | Analytical Geometry..... | in Olney's Gen. Geom. |

## SECOND TERM.

- |   |                      |                       |
|---|----------------------|-----------------------|
| 4 | Horace, Plautus.     |                       |
| 4 | Euripides, Æschylus. |                       |
| 4 | Conic Sections.....  | in Olney's Gen. Geom. |
| 3 | English.....         | Clark.                |

## THIRD TERM.

- |   |                                                  |       |
|---|--------------------------------------------------|-------|
| 4 | Horace, Juvenal, Cicero (Tusculan Disputations). |       |
| 4 | Euripides, Sophocles, Plato.                     |       |
| 2 | English (Chaucer etc.).                          |       |
| 5 | Chemistry.                                       |       |
|   | Botany (voluntary).....                          | Gray. |

English Essays, five in the year, or four if the student competes for the Prize Stage; Declamations, four.

Military Drill three times a week, each term.

## SOPHOMORE CLASS.

## Scientific Course.

## FIRST TERM.

Hours  
a-week.

|   |   |                        |                       |
|---|---|------------------------|-----------------------|
| 5 | { | French Classic Poetry. |                       |
|   | { | German Grammar. ....   | Comfort.              |
| 4 |   | Descriptive Geometry.  |                       |
| 3 |   | Rhetoric .....         | Hill.                 |
| 3 |   | Analytic Geometry..... | in Olney's Gen. Geom. |

## SECOND TERM.

|   |   |                                 |          |
|---|---|---------------------------------|----------|
| 5 | { | Contemporary French Literature. |          |
|   | { | German Grammar.....             | Comfort. |
| 3 |   | English.                        |          |
| 4 |   | Calculus.....                   | Olney.   |
| 3 |   | Descriptive Geometry.           |          |

## THIRD TERM.

|   |   |                                    |          |
|---|---|------------------------------------|----------|
| 5 | { | Contemporaneous French Literature. |          |
|   | { | German Reader. ....                | Whitney. |
| 2 |   | English.                           |          |
| 5 |   | Chemistry (with lectures).         |          |
|   |   | Botany (voluntary). ....           | Gray.    |
| 3 |   | Calculus (with lectures) .....     | Olney.   |

English Essays, five in the year, or four if the student competes for the Prize Stage ; Declamations, four.

Military Drill three times a week, each term.

## JUNIOR CLASS.

## Classical Course.

## FIRST TERM.

Hours  
a-week.

|   |                                  |          |
|---|----------------------------------|----------|
| 4 | Cicero, Juvenal.                 |          |
| 3 | Sophocles, Æschylus, Thucydides. |          |
| 5 | Mechanics . . . . .              | Jackson. |
| 3 | Logic . . . . .                  | Jevons.  |

## SECOND TERM.

|   |                                                       |         |
|---|-------------------------------------------------------|---------|
| 4 | Lucretius.                                            |         |
| 4 | Sophocles, Plato, Demosthenes.                        |         |
| 4 | Heat, Steam Engine, Electricity, Meteorology. . . . . | Foster. |
| 3 | Physiology . . . . .                                  | Huxley. |

## THIRD TERM.

|   |                                                          |            |
|---|----------------------------------------------------------|------------|
| 5 | Acoustics, Magnetism, Galvanism, Electro-Magnetism. .... | Foster.    |
| 5 | English Literature. . . . .                              | Coppée.    |
| 5 | Zoölogy. . . . .                                         | Nicholson. |
|   | Botany (voluntary). . . . .                              | Gray.      |

English Essays, four in the year; Declamations, four; two Orations in Chapel.

Military Drill or Physical Culture three times a week, each term.

## JUNIOR CLASS.

## Scientific Course.

## FIRST TERM.

| Hours<br>a-week. |                        |          |
|------------------|------------------------|----------|
| 4                | German Literature..... | Whitney. |
| 5                | Mechanics.....         | Jackson. |
| 3                | Chemistry.             |          |
| 3                | Logic.....             | Jevons.  |

## SECOND TERM.

|   |                                                   |                     |
|---|---------------------------------------------------|---------------------|
| 5 | German Tragedy.....                               | Goethe or Schiller. |
| 4 | Heat, Steam Engine, Electricity, Meteorology..... | Foster.             |
| 3 | Physiology ..                                     | Huxley.             |
| 3 | Chemistry or Mineralogy.                          |                     |

## THIRD TERM.

|   |                                                         |            |
|---|---------------------------------------------------------|------------|
| 5 | Acoustics, Magnetism, Galvanism, Electro-Magnetism..... | Foster.    |
| 5 | Zoölogy.....                                            | Nicholson. |
| 5 | English Literature.....                                 | Coppée.    |
|   | Botany (voluntary).....                                 | Gray.      |

English Essays, four in the year; Declamations, four; two Orations in Chapel.

Military Drill or Physical Culture three times a week, each term.



SENIOR CLASS.

Classical and Scientific.

FIRST TERM.

Hours  
a-week.

- 5 Metaphysics.
- 5 Géology.
- 4 Optics ..... Jackson.
- 1 English.

SECOND TERM.

Classical and Scientific.

- 4 Ethics and Christian Evidences by lectures and text-book.
- 4 Astronomy ..... White.
- 4 Political Economy.
- 3 English (Shakespearian Plays).

THIRD TERM.

Classical and Scientific.

- 4 U. S. History, Constitution etc. by lectures and text-book.
- 5 History and Philology.
- 3 History of Civilization.
- 2 Architecture.
- 1 Essays.

English Essays, four during the year ; two Orations in Chapel.

Military Drill or Physical Culture three times a week, each term.

Metaphysics, Ethics, Christian Evidences and the U. S. Constitution are obligatory ; but as substitute for one of the others, five recitations a week may be chosen from one or more of the Elective studies, with the consent and under the direction of the Faculty.

Special arrangements will be made for advanced work in the various departments.

SENIOR CLASS.

Elective.

FIRST TERM.

Ancient and Modern Languages.  
Analytical Chemistry.  
Zoölogy.  
Physics.

SECOND TERM.

Elective.

Ancient and Modern Languages.  
Zoölogy.  
Physics.  
Mineralogy.

THIRD TERM.

Elective.

Ancient and Modern Languages.  
Physics.  
Botany.  
Lectures on Law.

Reading in History (with examination and prizes) may be pursued under the direction of a Professor.

Military Drill or Physical Culture three times a week, each term.

## DEGREES AND HONORS.

---

### DEGREES.

The Degrees of A. B. and B. S. are conferred only on students who have entered College before the close of the first Senior term, who are in full Classical or Scientific standing, who have paid all dues to the College Treasury and returned all books borrowed from the Library and who attend the Conferring of Degrees or are expressly excused from such attendance. The Degree of C. E. is attained as stated on page 57.

Honorary Degrees are conferred by the Corporation.

### HONORS.

All Senior Commencement appointments or prizes are limited to Classical or Scientific students in full standing and entered at or before the beginning of the Senior year and to Engineering students in full standing entered likewise and also in full standing in the Rhetorical Department of the Scientific course.

### COMMENCEMENT ORATIONS.

These Honors are assigned to the ten Seniors taking the highest grades on the Merit Roll of the class. Under present regulations, these ten alone become competitors for the Blatchford Oratorical Medals.

### THE SALUTATORY.

This honor is awarded to one of the ten Seniors who attain appointments for Commencement Orations.

### BLATCHFORD ORATORICAL MEDALS.

Hon. Richard M. Blatchford, LL. D., founded Oratorical Prizes consisting of two gold medals of the value of the interest of

\$1,000, which are given to the two members of the graduating class who deliver at Commencement the best orations; "regard being had alike to their elevated and classical character and to their graceful and effective delivery." These medals, of the values of forty and thirty dollars for the orations first and second in merit, are awarded by a committee of the Trustees and presented at the close of the exercises.

#### WARNER PRIZE.

Hon. Horatio G. Warner, LL. D., of Rochester, founded an annual prize consisting of silver plate of the value of \$50, to be presented at Commencement to the "graduate of Union College Classical course who shall reach the highest standing in the performance of collegiate duties and also sustain the best character for moral rectitude and deportment, without regard to religious practice or profession." The prize is awarded by the Faculty.

#### INGHAM PRIZE.

Hon. Albert C. Ingham, LL. D., of Meridian, N. Y., for the purpose of promoting a familiarity with the best English classics, founded an annual prize of seventy dollars (in the form of plate or medal or money or both medal and money, as preferred) to be awarded at Commencement to that Senior connected with the College for not less than two years who shall offer the best essay on one of two assigned subjects in English Literature or History.

The Essay must contain not less than 4,000 words nor more than 4,500. It must have a fictitious signature which must also be superscribed on a sealed note containing the real name. The Essay with the note must be transmitted by the first day of June.

#### ALLEN ESSAY PRIZES.

Hon. Wm. F. Allen, LL. D., of Oswego, N. Y., established prizes for the three best essays on any subject, submitted by appointed members of the Senior class. They are respectively \$25, \$20 and \$15 and are presented at Commencement.

The Essay must contain not less than 2,500 words nor more

than 3,000 and must be signed and transmitted (with note) like the Ingham Essay by June 1st.

#### CLARK PRIZES FOR ESSAYS IN LITERATURE.

Prizes consisting of books are awarded at Commencement to the two members of the Senior class of 1881 who offer the best essays on assigned subjects in English Literature. Two similar prizes are offered to the Junior class.

The Essay must contain not less than 2,500 words nor more than 3,000 and must be signed and transmitted (with note) like the preceding by June 1st.

#### ORATORICAL PRIZES

are presented at Commencement to the two Juniors and the two Sophomores who deliver the best orations on the occasion of Prize Speaking in Commencement week. Six Juniors and four Sophomores are selected for this competition by a Committee of the Faculty on the first Saturday in June; regard being given both to composition and delivery. Candidates must be in full standing.

#### NOTT PRIZE SCHOLARSHIPS.

See page 40.

#### CULTURE AND ART PRIZES.

These prizes, provided by Miss Catharine L. Wolfe, are awarded at Commencement for proficiency or progress in Drawing or in such other artistic accomplishment as may be pursued; also for satisfactory progress in courses of historical or critical reading etc.

#### LEVI PARSONS PRIZES.

A certain surplus, as it may occur, of the income of the Levi Parsons Fund may be appropriated for distribution on recommendation of the Presidents of the College and the Levi Parsons Library Board.

#### MILITARY AND ATHLETIC PRIZES.

These are awarded at Commencement for proficiency or progress in the practice of Tactics or Marksmanship and for diligence in Gymnastic or Calisthenic exercises.

Through the kindness of Rev. Walter Thompson of Waterford, N. Y., the following prizes for proficiency in exercises in the Military Department will be awarded at Commencement, 1881 :

To the uniformed cadet who has the best record for attention to duty, proficiency and attendance :

|                          |            |
|--------------------------|------------|
| For the second term..... | \$5 medal. |
| For the third term ..... | 5 medal.   |
| For the whole year.....  | 10 medal.  |

To the cadet officers who have the best record for attention to duty, proficiency and attendance during

|                       | 1st prize. | 2d prize. |
|-----------------------|------------|-----------|
| The second term ..... | \$5.       | Medal.    |
| The third term .....  | 5.         | Medal.    |
| The whole year .....  | 10.        | \$5.      |

To the uniformed cadets who make the best record at target practice :

|                    |             |
|--------------------|-------------|
| First prize .....  | \$10.       |
| Second prize ..... | 5.          |
| Third prize .....  | 3 or medal. |
| Fourth prize ..... | Medal.      |

To any uniformed cadet having a record of at least 80 per cent. in deportment, attendance, proficiency and soldierly appearance who makes best score at target practice at all ranges, a Remington double-barreled shot-gun..... \$40 model.

To the cadet passing best examination in the subjects studied during the year..... \$10.

Second best..... \$5.

---

## CLASS REGULATIONS.

---

A daily record of attendance at Class and Chapel and of scholarship is kept by the Professors and is transmitted by the Registrar at the end of each term or more frequently to the student's parent or guardian.



The highest grade for recitation is Ten. Any grade below Six indicates failure.

The Examination grade counts as five Recitation grades.

The ten highest grades for the whole course entitle those taking them to appointment as Commencement Orators.

Failure in any study involves conditions which must be made up before the student can attain full standing.

Absences are recorded as of three kinds, permitted, excused and unexcused. No one but the President or Dean can authorize the record of an absence as permitted.

Absences are entered against a student at the beginning of a term until he reports his return to the Registrar. A like report is required after absence from sickness or by permission.

Recitations lost by excused absences are considered failures unless made up.

Examinations lost by absence must be made up as a condition of regular standing.

A student absent from his College exercises fifteen times in any term without excuse is reprimanded; ten additional unexcused absences within the same term cause him to be put on probation, and his parent or guardian is informed; five additional unexcused absences within the same term may cause his separation from College. After a student has received any of the above censures, ten absences without excuse in any subsequent term subject him to a reprimand, six more to probation and four more to separation from the College.

Engineering students in full standing and passed on the final examination may be excused by the President from attendance during the third Senior term in order to join Engineering field-parties.

---

## RESIDENCE.

---

Students not rooming in College must report their residence to the Registrar at the beginning of the term; also any change made during the term.

Students are not allowed to change their room during term time without permission of the President; for every change a sum of two dollars is added to the term-bill. Keys of rooms must be left at the Treasurer's office during vacation.

---

## MORAL REGULATIONS.

---

The relation of the Faculty to the students is friendly rather than formal.

The clear evidence that a student's continuance in College is resulting in no adequate advantage to himself or is injurious to others will justify his separation from the institution. Any young man who indulges in gaming, intemperance or other vice, who is habitually absent from his room at night or neglectful of his studies cannot be allowed to remain.

Students making disorder in their sections may be required by the Faculty to remove.

---

## EXPENSES AND AID.

---

The College term-bill includes room-rent and may thus be found as economical as apparently smaller bills of other institutions.

The bill for tuition and room is \$40 a term; for the Laboratory Course, as on page 22. It is to be paid within the first week of the term, reasonable postponement being granted when necessary.

Students, unless coming from another College, pay for entrance into the Freshman class, \$5; into the Sophomore, \$7; into the Junior, \$9; into the Senior, \$12.

The total expense of tuition, room, text-books, board, lights, washing etc. during the three terms varies from \$250 to \$350.

Board can be procured for \$3 a week. Furniture may be sold at the student's departure.

To a certain number of applicants, the College affords liberal aid in the form of Scholarships and Fellowships as described below :

#### ORDINARY SCHOLARSHIPS.

Those of the first grade afford the incumbents at the end of each term on condition of good conduct and diligence a credit on the books of the Registrar to the full amount of the term-bill.

Those of the second grade yield on the same condition a credit to the amount of half the term-bill.

#### CORNELL SCHOLARSHIPS.

##### NOTT PRIZE SCHOLARSHIPS.

Among the several classes of scholarships founded by the late President Nott is a class of Prize Scholarships.\*

A Prize Scholarship with the free tuition is equivalent to \$150 a year or \$600 for the College course.

An examination of candidates is held early in the first term of the Freshman year and also at a later period in the same year and the appointments are made according to certain rules prescribed by the Founder.

A Prize Scholarship being a special distinction, the incumbent is required to maintain high standing in all respects. Among the rules to be observed is one which forbids the use during the period of incumbency, of intoxicating liquor as a beverage and of tobacco in any of its forms.

#### JOHN DAVID WOLFE MEMORIAL SCHOLARSHIPS FOUNDATION.

The income of this Fund of Fifty Thousand Dollars, established by the generosity of Miss Catharine L. Wolfe, furnishes to applicants pecuniary aid in various amounts.

---

\*Few of these are yet actually available but their ultimate endowment is secured by the prospective sale of valuable lands.

## LEVI PARSONS SCHOLARSHIPS FOUNDATION.

This generous benefaction of Fifty Thousand Dollars by Hon. Levi Parsons maintains

Two scholarships yielding respectively three hundred dollars a-year ;

Three scholarships yielding respectively two hundred dollars a-year ;

Eight scholarships yielding respectively one hundred and fifty dollars a-year.

Among candidates found competent upon examination, preference is given

1st, to blood relatives of the Founder who live in the county of Fulton, Montgomery or Hamilton in the State of New York and especially to those residing in Johnstown, Fulton Co., and bearing the name of Parsons.

2nd, to candidates residing in the following places according to the following order :

1. The villages (parishes) of Gloversville and Kingsborough, Fulton Co. ;
2. The township of Johnstown ;
3. The county of Fulton ;
4. The adjoining counties of Montgomery and Hamilton ;
5. To blood relatives residing in any other part of the United States.

Incumbents of the Levi Parsons Fund are required to maintain good standing in all respects throughout their College course.

The candidates are examined by a committee of the Board of Trustees of the Levi Parsons Library of Gloversville and Kingsborough, Fulton Co., N. Y., and are nominated by them to the Scholarships. Applications are received by Alanson Judson, Esq., President of the Board, Gloversville.

## MASON SCHOLARSHIPS.

These scholarships were founded in 1881 by Miss Ellen and Miss Ida Mason. Their gift of two thousand dollars has secured free tuition and room in perpetuity to two beneficiaries. The

entire Donation being Five Thousand Dollars, the income on the remaining three thousand is devoted to other forms of aid.

### CLARKSON NOTT POTTER SCHOLARSHIPS.

#### STATE SCHOLARSHIPS.

---

Application for the benefit of any Scholarship Fund except the Levi Parsons Fund must be made in writing to the President of Union College or to such person as he may appoint and it must be accompanied by testimonials from two or more responsible persons (one of whom should be the last instructor) to the real need, ability, diligence and good character of the applicant.

Continuance in any Scholarship depends on the continued worthiness of the incumbent.

For further information regarding Scholarships, address Prof. Wendell Lamoroux.

#### FELLOWSHIPS.

Several Fellowships, sustained by Miss Catharine L. Wolfe, afford to the incumbents the privilege of pursuing graduate studies with aid toward personal expenses. These are granted only to students who have shown proficiency and promise in the study to be pursued.

---

## ADMISSION.

---

The Entrance Examinations are held on the first two days and the last two days of the summer vacation as indicated in the Calendar ; also, at the opening of any term.

Candidates must be at least sixteen years old and as a preliminary to the Entrance Examination they must call on the President and present satisfactory testimonials of character and scholarship.

Candidates from other colleges must bring letters of honorable dismission and pass satisfactory examinations.

Candidates for a Degree must enter before the close of the first Senior term.



Candidates not desiring a degree may be admitted by the President at any time to the Eclectic course, subject to suitable regulations.

Candidates not fully prepared may be admitted on trial, subject to conditions.

Candidates for the Freshman Classical course are examined in English Grammar; Arithmetic (Davies' University or an equivalent); Algebra (to equations of the second degree); Plane Geometry, five books; Allen & Greenough's Latin Grammar, including Prosody; Cæsar's Commentaries, four books; Virgil's *Æneid*, six books; Cicero, six Orations, including Milo; Sallust's *Catiline*; Sallust's *Jugurtha* or Virgil's *Eclogues*; Arnold's Latin Prose Composition, 1st part, 12 chapters; Goodwin's Greek Grammar; Greek Reader; Xenophon's *Anabasis*, three books; Homer's *Iliad*, one book; and Ancient Geography.\*

Those intending to pursue the Classical course should enter at the beginning of the Freshman year fully prepared; without such preparation, time and strength needed for regular studies are consumed in making up deficiencies. If in their preparation candidates have time to spare, it is desirable for obvious reasons that they should not anticipate the college studies.

Candidates for the Freshman Scientific course or that of Civil Engineering are examined in English Grammar, Modern Geography, Arithmetic, Algebra to equations of the second degree, and Plane Geometry, five books.

Candidates for any other class are also examined in all studies previously pursued by that class.

When a candidate is admitted, matriculation is procured by signature to the following: *I promise on honor to perform all duties incumbent on a student of Union College in a faithful and gentlemanly manner to the best of my ability.*

---

\*The attention of instructors is particularly directed to the student's need of a full and accurate knowledge of the Greek and the Latin Grammar. Deficiency in this knowledge will prevent admission.

The diversity in elementary works is one of the difficulties that a college has to meet. To avoid this, all instructors preparing pupils for Union College are requested to use the elementary books mentioned here.



# STUDENTS.

---

## FELLOWS.

|                                         |                      |
|-----------------------------------------|----------------------|
| JAMES E. BENEDICT, As't in Zoölogy..... | South Norwalk, Conn. |
| WILBER E. ANDERSON, B. S., C. E.,.....  | Le Roy.              |
| JOHN L. FITZGERALD, C. E.,.....         | Brunswick, Ga.       |
| ANDREW H. DOUGHERTY, B. S.,.....        | Parkville, Mich.     |
| LOUIS J. DAVIDS, C. E.,.....            | New Rochelle.        |

## SENIOR CLASS.

|                                           |                    |
|-------------------------------------------|--------------------|
| <i>e</i> FRANKLIN EUGENE ABBOTT,.....     | Brunswick.         |
| <i>c</i> COURTLAND VIRGINIUS ANABLE,..... | Springfield, Mass. |
| <i>s</i> FREDERICK SELDEN BLOSS,.....     | Troy.              |
| <i>s</i> FREDERICK W. CAMERON,.....       | Albany.            |
| <i>s</i> ALEXANDER CAMPBELL,.....         | Troy.              |
| <i>e</i> PERRY ELLIS CARHART,.....        | Guilderland.       |
| <i>c</i> ANDREW DRUMMOND DARLING,.....    | Andes.             |
| <i>c</i> JOSEPH PAIGE DAVIS,.....         | Cobleskill.        |
| <i>c</i> EDWARD IGNATIUS DEVLIN,.....     | Albany.            |
| <i>ec</i> LESTER COOLIDGE DICKINSON,..... | Warrensburgh.      |
| <i>c</i> HENRY RUFUS FANCHER,.....        | McGrawville.       |
| <i>e</i> SAMUEL GOURDIN GAILLARD,.....    | Charleston, S. C.  |
| <i>c</i> JAMES RICHARD GIBSON,.....       | Delhi.             |
| <i>c</i> HORATIO GATES GLEN,.....         | Schenectady.       |
| <i>c</i> JOHN JAMES HENNING,.....         | Argyle.            |
| <i>c</i> EDWARD CAMPBELL JOHNSON,.....    | Schenectady.       |
| <i>s</i> CHARLES SUMNER KING,.....        | Hammonton, N. J.   |
| <i>s, e</i> WILLIAM BARKER LANDRETH,..... | Schenectady.       |
| <i>s</i> EDWARD TEN EYCK LANSING,.....    | Little Falls.      |
| <i>c</i> GEORGE GIBBS LELAND,.....        | Mayesville.        |
| <i>c</i> RICHARD TIMOTHY LOMASNEY,.....   | Schenectady.       |
| <i>s</i> JOB PHILIP LYON,.....            | Troy.              |
| <i>c</i> RIPLEY SHURTLEFF LYON,.....      | Schenectady.       |
| <i>s</i> WILLARD CHARLES MARSELIUS,.....  | Scotia.            |

---

*c*, Classical ; *s*, Scientific ; *e*, Engineering ; *ec*, Eclectic ; *l*, Laboratory.

## ERRATA.

W. B. Anderson; for B. S., read A. B.  
 A. H. Dougherty; for B. S., read A. B.  
 C. W. Vanderveer; omit.  
 E. H. Adriance; transpose to 2nd Junior list.  
 F. B. Gary; transpose to 2nd Senior list.  
 J. M. Harvey; transpose to 2nd Senior list.  
 W. H. Ahern; omit.  
 T. P. Washburne; transpose to 2nd Sophomore list.  
 M. Beattie; transpose to 2nd Junior list.  
 M. J. Couch; transpose to 2nd Junior list.  
 O. Early; transpose to 2nd Junior list.  
 N. G. Evans; transpose to 2nd Junior list.  
 W. Miller; omit from 2nd Sophomore list.  
 J. S. Van Vechten; transpose to 2nd Junior list.  
 J. D. White; transpose to 2nd Junior list.  
 Theodore Irving, jr.; read Theodore Irwin, jr.  
 J. H. Orsborn; omit from 2nd Freshman list.  
 D. R. Peoli; omit from 2nd Freshman list.  
 W. Sauter; transpose to 2nd Sophomore list.  
 A. C. Swortfiguer; transpose to 2nd Sophomore list.  
 J. W. Thomson; transpose to 2nd Sophomore list.  
 J. H. Veeder; omit from 2nd Freshman list.

In the Summary, read

|                   |   |   |   |   |   |   |     |
|-------------------|---|---|---|---|---|---|-----|
| Senior Class,     | - | - | - | - | - | - | 66  |
| Junior Class,     | - | - | - | - | - | - | 52  |
| Sophomore Class,  | - | - | - | - | - | - | 49  |
| Freshman Class,   | - | - | - | - | - | - | 67  |
| University Total, | - | - | - | - | - | - | 469 |

On page 51, insert SALUTATORY, Frederic T. Rogers.

The Degree of B. S. (pp. 34, 44 and 51) is not conferred;  
 both Classical and Scientific graduates receiving the Degree  
 of A. B.

## JUNIOR CLASS.

|                |                                    |                        |
|----------------|------------------------------------|------------------------|
| <i>c</i>       | JOHN MCCAULEY ADAIR,.....          | Ox Bow.                |
| <i>c</i>       | EDWARD HUMPHREY ADRIANCE, .....    | Scipio.                |
| <i>s, e</i>    | ALBERT EDWARD CARMICHAEL, .....    | So. Sandlake.          |
| <i>c</i>       | G. ALFRED P. CODWISE, .....        | Grantville, Mass.      |
| <i>e</i>       | JOHN JENKS DROWNE, jr., .....      | Plattsburgh.           |
| <i>c</i>       | THOMAS DOUGALL ELDER, .....        | Pattersonville.        |
| <i>c</i>       | JAMES R. FAIRGRIEVE, .....         | Schenectady.           |
| <i>c</i>       | CHARLES EDWARD FAY, .....          | Northampton.           |
| <i>s</i>       | DAVIDSON SPRIGG FLOWER, .....      | Alexandria, La.        |
| <i>c</i>       | EDMUND ERASTUS FORD, .....         | Schenectady.           |
| <i>e</i>       | WILLIAM GIFFORD, .....             | Schenectady.           |
| <i>c</i>       | ELIJAH WARNER GREENE, .....        | New Lebanon.           |
| <i>c</i>       | SHELDON GRISWOLD, .....            | Delhi.                 |
| <i>c</i>       | LUTHER R. HARGRAVE, .....          | Madrid.                |
| <i>ec</i>      | HERBERT CALVIN HINDS, .....        | East Greenwich.        |
| <i>c</i>       | WILLIAM MEYER LEWIN, .....         | Upper Marlboro, Md.    |
| <i>s</i>       | ALFRED AUGUSTUS McMURRAY, .....    | Lansingburgh.          |
| <i>s</i>       | ROBERT EDWARD MORGAN, .....        | Tinmouth, Vt.          |
| <i>c</i>       | EPHRAIM CLARK MURRAY, .....        | Edisto Island, S. C.   |
| <i>e</i>       | JOHN GEORGE PEOLI, .....           | Havana, Cuba.          |
| <i>ec</i>      | WALTER HUTSON PHYFE, .....         | Delhi.                 |
| <i>s</i>       | HENRY RUFUS PIERSON, jr., .....    | Albany.                |
| <i>c</i>       | WILLIAM JAMES POLLARD, .....       | Seneca Falls.          |
| <i>c</i>       | ALBERT PRATT, .....                | Fort Edward.           |
| <i>s</i>       | JOSEPH EUGENE RANSDALL, .....      | Alexandria, La.        |
| <i>s</i>       | WILLIAM BOARDMAN REED, .....       | Scotch Plains, N. J.   |
| <i>ec</i>      | WILLIAM CAMPBELL ROSEBOOM, .....   | Roseboom.              |
| <i>c</i>       | CHARLES TEMPLE, .....              | Schenectady.           |
| <i>ec</i>      | EDWARD THOMSON, jr., .....         | Johnsburgh.            |
| <i>c</i>       | WILSON H. VAN BUREN, .....         | Mt. Vision.            |
| <i>c</i>       | FREDERIC DANIEL VAN WAGENEN, ..... | Fulton.                |
| <i>c, s, e</i> | WILLIAM ALFRED WADDELL, .....      | White Lake.            |
| <i>c</i>       | ELMER BRITON WALLER, .....         | Seneca Falls.          |
| <i>c</i>       | SCHUREMAN HALSTED WATKINS, .....   | Baltimore, Md.         |
| <i>c</i>       | BAYARD WHITEHORNE, .....           | Schenectady.           |
| <i>c</i>       | EDWARD CHARLES WHITMYER, .....     | Schenectady.           |
| <i>s</i>       | ARTHUR SILAS WRIGHT, .....         | Worcester.             |
| <i>ec</i>      | ELIPHALET NOTT WRIGHT, .....       | Boggy Depot, Ind. Ter. |
| <i>c</i>       | FRANK HALL WRIGHT, .....           | Boggy Depot, Ind. Ter. |
| <i>c</i>       | EDMUND RHETT YOUNG, .....          | Columbia, S. C.        |
|                | CHARLES CHAUNCEY DURYEE, .....     | Schenectady.           |
|                | FRANK BOYD GARY, .....             | Cokesbury, S. C.       |

|                                   |                   |
|-----------------------------------|-------------------|
| JOHN MONROE HARVEY, .....         | Schenectady.      |
| NATHAN GARDNER KINGSLEY, .....    | Jonesville.       |
| JAMES AUGUSTUS MCFARRAN, .....    | Cherry Valley.    |
| WALTER MILLER, .....              | Minden.           |
| HERMAN MOURUS SCHERMERHORN, ..... | Schenectady.      |
| SAMUEL MAIRS SYLVESTER, .....     | Saratoga Springs. |

## SOPHOMORE CLASS.

|                                              |                       |
|----------------------------------------------|-----------------------|
| <i>s</i> JOHN WILMER ADAMS, .....            | Belmond, Iowa.        |
| <i>c</i> DANIEL DULANY ADDISON, .....        | Washington, D. C.     |
| <i>ec</i> WILLIAM H. AHERN, .....            | Troy.                 |
| <i>c</i> WILLIAM WHALEY BELLINGER, .....     | Charleston, S. C.     |
| <i>ec</i> ROSWELL ALPHONZO BENEDICT, .....   | Schenectady.          |
| <i>c</i> FREDERICK FULLER BENNETT, .....     | Hyde Park, Ill.       |
| <i>c</i> JAMES ROBERT BOLTON, .....          | Pelham.               |
| <i>c</i> JOHN RANSOM BRIDGE, .....           | Le Roy.               |
| <i>s</i> FRANK BURTON, .....                 | Gloversville.         |
| <i>e</i> JAMES CANTINE, jr., .....           | Stone Ridge.          |
| <i>c</i> CHARLES HOWARD CLUTE, .....         | Schenectady.          |
| <i>s</i> LOUIS AUGUSTUS COFFEEN, .....       | Potsdam.              |
| <i>c</i> DANIEL MORRISON COUNTERMINE, .....  | Schenectady.          |
| <i>c</i> RICHARD WARD DENT, .....            | Schenectady.          |
| <i>c</i> LUTHER JAMES EMERSON, .....         | Moorton Station, Del. |
| <i>s</i> JOHN GARY EVANS, .....              | Cokesbury, S. C.      |
| <i>s</i> WILLIAM MORRIS GILBERT, .....       | Willard.              |
| <i>c</i> WILLIAM KNOX GILCHRIST, .....       | Schenectady.          |
| <i>c</i> ABRAM TRUAX CONDE HAMLIN, .....     | Winona, Minn.         |
| <i>c</i> JOHN RAVENSCROFT HARDING, .....     | Washington, N. C.     |
| <i>s</i> JAMES COOK HEMPHILL, .....          | Ballston.             |
| <i>e</i> CHARLES ANDREW HOLLA, .....         | Sing Sing.            |
| <i>c</i> GULIAN SCHMALTZ HOOK, .....         | Schenectady.          |
| <i>c</i> GULIAN VERPLANCK LANSING, .....     | Schenectady.          |
| <i>c</i> JAMES BURNSIDE WANDS LANSING, ..... | Schenectady.          |
| <i>c</i> WILLIAM OZIAS LEWIS, .....          | Delhi.                |
| <i>s</i> LEMUEL GARDNER LLOYD, .....         | Pittsfield, Mass.     |
| <i>s</i> JOHN WARDEN MCCAULEY, .....         | Stanley.              |
| <i>c</i> FRANKLIN WILLIAM MCCLELLAN, .....   | Cambridge.            |
| <i>s</i> DANIEL CRIPPEN MCELWAIN, .....      | Cohoes.               |
| <i>e</i> TREDWELL WOODBRIDGE MOORE, .....    | Baltimore, Md.        |
| <i>ec</i> ALBERT BURR NASH, .....            | South Norwalk, Conn.  |
| <i>s</i> LEFFERTS MORRELL POWELL, .....      | Brooklyn.             |
| <i>s</i> ARCHIBALD WADSWORTH RAY, .....      | Columbia, S. C.       |
| <i>s</i> JOHN HENRY SAND, .....              | Knox.                 |

## 48 STUDENTS—SOPHOMORE CLASS—FRESHMAN CLASS.

|                                          |                   |
|------------------------------------------|-------------------|
| <i>c</i> GEORGE WARNER SHERWOOD,.....    | Ballston.         |
| <i>s</i> BARNARD CLEVELAND SLOAN,.....   | Columbia, S. C.   |
| <i>ec</i> CHARLES SMITH TREUTLEN,.....   | Cokesbury, S. C.  |
| <i>c</i> TRACY WALWORTH,.....            | Saratoga Springs. |
| <i>s</i> THOMAS PRESTON WASHBURN,.....   | Maple Grove.      |
| <i>e</i> ALBERT MOORE WESTINGHOUSE,..... | Schenectady.      |
| <i>c</i> HENRY CHANCELLOR WOOD,.....     | Newtown.          |
| <i>e</i> JAMES CORNELIUS WRIGHT,.....    | Dean's Corners.   |

---

|                                   |                      |
|-----------------------------------|----------------------|
| MATTHEW BEATTIE,.....             | Cornwall.            |
| MARSHALL JOSHUA COUCH,.....       | South Norwalk, Conn. |
| OWEN EARLY,.....                  | Schenectady.         |
| NATHAN GEORGE EVANS,.....         | Cokesbury, S. C.     |
| WALTER MILLER,.....               | Minden.              |
| JOSIAH HUIL ORSBORN,.....         | Alexandria, La.      |
| DANIEL RAPHAEL PEOLI,.....        | Havana, Cuba.        |
| CHARLES FERDINAND TIMMERMAN,..... | Amsterdam.           |
| JOHN SUNDERLIN VAN VECHTEN,.....  | Chateaugay.          |
| JOHN HENRY VEEDER,.....           | Schenectady.         |
| JOSEPH DOUGLAS WHITE,.....        | Hoosac Falls.        |

### FRESHMAN CLASS.

|                                             |                        |
|---------------------------------------------|------------------------|
| <i>s</i> THOMAS EDWARD ADAMS,.....          | New Orleans, La.       |
| <i>s</i> GEORGE FRANKLIN ALLISON,.....      | Oswego.                |
| <i>c</i> JOHN EDMUND BACON, jr,.....        | Columbia, S. C.        |
| <i>s</i> EDGAR STARR BARNEY,.....           | Worcester.             |
| <i>c</i> DOW BEEKMAN,.....                  | Middleburgh.           |
| <i>s</i> FREDERIC VERNON BENNETT,.....      | Minerva.               |
| <i>e</i> SHERMAN EDWIN BISHOP,.....         | Hancock.               |
| <i>c</i> CHARLES WILLIAM BOYD,.....         | Union, S. C.           |
| <i>ec</i> CYRUS BURHANS,.....               | Cobleskill.            |
| <i>s</i> MATTHEW CALBRAITH BUTLER, jr,..... | Edgefield C. H., S. C. |
| <i>e</i> BENJAMIN GUERARD CHISOLM,.....     | Charleston, S. C.      |
| <i>e</i> CHARLES ALLEN COCKROFT,.....       | Walden.                |
| <i>c</i> WILLIAM NELSON POTTER DAILEY,..... | Schenectady.           |
| <i>c</i> JOHN FRANCIS DELANEY,.....         | Albany.                |
| <i>e</i> HENRY FARR DEPUY,.....             | Bath.                  |
| <i>s</i> IRVING PERRY ESTCOURT,.....        | Schenectady.           |
| <i>c</i> GEORGE WILLIAM FAIRGRIEVE,.....    | Schenectady.           |
| <i>ec</i> FRANK STUART FERGUSON,.....       | Gloversville.          |
| <i>c</i> GEORGE EGBERT FISHER,.....         | Westerlo.              |
| <i>c</i> CORNELIUS EDWARD FRANKLIN,.....    | Albany.                |

|                                              |                       |
|----------------------------------------------|-----------------------|
| <i>c</i> LOUIS ROGERS GARNSEY,.....          | Clifton Park.         |
| <i>s</i> EDWARD LINCOLN GARRETT, .....       | Milton.               |
| <i>c</i> CHARLES DONNEL GIBSON, .....        | Dover, Del.           |
| <i>e</i> JAMES GEREAU GREENE,.....           | Clyde.                |
| <i>s</i> CLEVELAND CONVERS HALE,.....        | Cleveland, O.         |
| <i>c</i> FREDERIC DIXON HALL, .....          | Antwerp.              |
| <i>s</i> JOHN ALEXANDER HEATLY, .....        | Schenectady.          |
| <i>c</i> JOHN WILLIAM HIGSON,.....           | Salt Lake City, Utah. |
| <i>s</i> CHARLES HENRY HILL,.....            | Gloversville.         |
| <i>c</i> JOHN BLACKHALL HUTCHISON, .....     | Brooklyn.             |
| <i>e</i> ARTHUR HAROLD KASIMIR JERVIS, ..... | Le Roy.               |
| <i>ec</i> WILBUR MACAULAY JUDD,.....         | Jewett.               |
| <i>s</i> JAMES JOHANNES KEMP, .....          | Ballsville, Va.       |
| <i>s</i> CHARLES ADAMS KITTS,.....           | Oswego.               |
| <i>c</i> STEPHEN FRANCIS LEO,.....           | Providence, R. I.     |
| <i>c</i> REESE BROWN MCCOWN,.....            | Darlington, S. C.     |
| <i>c</i> JOHN MCENCROE, .....                | Schenectady.          |
| <i>e</i> DAVID SPENCER MERRITT, .....        | Carmel.               |
| <i>s</i> HENRY LEE MILLER,.....              | Columbia, S. C.       |
| <i>ec</i> FRANK H. MOUNTAIN,.....            | Schenectady.          |
| <i>c</i> HERMAN VEDDER MYNDERSE, .....       | Schenectady.          |
| <i>c</i> DANIEL NAYLON, jr, .....            | Schenectady.          |
| <i>e</i> PICKENS NEAGLE,.....                | Columbia, S. C.       |
| <i>ec</i> FREDERICK SYDNEY PARMENTER, ..     | Troy.                 |
| <i>s</i> GEORGE FRANK PARSONS, .....         | Gloversville.         |
| <i>c</i> HARRY VAN NESS PHILIP,.....         | New York City.        |
| <i>c</i> HERBERT GEORGE PORCHER, .....       | Salt Lake City, Utah. |
| <i>s</i> JONATHAN RIDER POWELL, jr, .....    | Brooklyn.             |
| <i>ec</i> HENRY ZACHARIAH PRATT,.....        | Greenbush.            |
| <i>s</i> FRANK WESTON RAY, .....             | Columbia, S. C.       |
| <i>e</i> FREDERICK ZADOCK ROOKER,.....       | Albany.               |
| <i>ec</i> WILLIAM SAMUEL ROYALL, .....       | Mt. Pleasant, S. C.   |
| <i>c</i> CLARENCE W. STRYKER, .....          | Hammondsport.         |
| <i>s</i> LAWSON CLAY TALLEY, .....           | Columbia, S. C.       |
| <i>e</i> EUGENE AUGUSTUS HOFFMAN TAYS, ..... | El Paso, Texas.       |
| <i>e</i> JOSEPH WILKIN TAYS, jr, .....       | El Paso, Texas.       |
| <i>s</i> CHARLES BRADFORD TEMPLETON, ..      | Albany.               |
| <i>ec</i> FRANK SKILLMAN TITUS, .....        | Roslyn.               |
| <i>s</i> LANSING VAN AUKEN,.....             | New Scotland.         |
| <i>c</i> ANDREW P. VERMILYE, .....           | Schenectady.          |
| <i>e</i> RAYMOND S. WELLS, .....             | Schuylerville.        |
| <i>e</i> ERNEST WINNE,.....                  | Knowersville.         |



|                                         |                    |
|-----------------------------------------|--------------------|
| <i>c</i> WILLIAM GILLISS WOOLFORD,..... | Princess Anne, Md. |
| <i>s</i> HARRY C. YOUNG,.....           | Schenectady.       |

---

|                                   |                   |
|-----------------------------------|-------------------|
| JOSEPH COHEN, Jr.,.....           | Charleston, S. C. |
| ALFRED KOON FREIOT, .....         | Troy.             |
| THEODORE IRVING, jr, .....        | Oswego.           |
| EDWARD HUMPHREY ADRIANCE, .....   | Scipio.           |
| JOSIAH HUIL ORSBORN,.....         | Alexandria, La.   |
| DANIEL RAPHAEL PEOLI,.....        | Havana, Cuba.     |
| WILLIAM SAUTER,, .....            | Schenectady.      |
| ARTHUR CLAGHORN SWORTFIGUER,..... | Schenectady.      |
| JAMES W. THOMSON, .....           | Schenectady.      |
| JOHN HENRY VEEDER, ....           | Schenectady.      |
| THOMAS PRESTON WASHBURNE,.....    | Maple Grove.      |

---

## SUMMARY OF STUDENTS OF UNION UNIVERSITY.

## UNION COLLEGE.

|                     |   |   |   |   |   |   |   |   |     |
|---------------------|---|---|---|---|---|---|---|---|-----|
| RESIDENT GRADUATES. | - | - | - | - | - | - | - | - | 5   |
| SENIOR CLASS.       | - | - | - | - | - | - | - | - | 65  |
| JUNIOR CLASS.       | - | - | - | - | - | - | - | - | 48  |
| SOPHOMORE CLASS.    | - | - | - | - | - | - | - | - | 54  |
| FRESHMAN CLASS.     | - | - | - | - | - | - | - | - | 75  |
| MEDICAL DEPARTMENT. | - | - | - | - | - | - | - | - | 176 |
| LAW DEPARTMENT.     | - | - | - | - | - | - | - | - | 54  |
| Total,              | - | - | - | - | - | - | - | - | 477 |

The figures for Union College present the total number admitted to each class during its course.

## DEGREES CONFERRED IN COURSE, 1880.

---

### A. B.

ROBERT C. ALEXANDER,  
RICHARD D. ANABLE,  
ISAAC G. BURNETT,  
JOSEPH D. CRAIG,  
FRANK P. S. CRANE,  
GEORGE E. DIXON,  
JOHN ICKLER,  
JOHN A. KEMP,  
ROBERT J. LANDON,  
ROBERT T. S. LOWELL, jr,  
JAMES M. McMASTER,  
JOHN V. L. PRUYN, jr.

### B. S.

ANDREW H. DOUGHERTY,  
DAVID MUHLFELDER,  
FREDERIC T. ROGERS,  
LUCAS G. TUTTLE,  
MILES W. VOSBURGH.

### B. S. AND C. E.

HORACE J. CAMPBELL,  
DAVID F. GLOVER.

WILBER E. ANDERSON,  
WILLIAM H. SADLER.

### C. E.

JOHN L. FITZGERALD,  
WRIGHT J. SWEET,

ELI S. GODFREY.

## AWARDS, 1880,

### COMMENCEMENT ORATIONS.

FREDERIC T. ROGERS, Salutatory.

|                          |                     |
|--------------------------|---------------------|
| ROBERT C. ALEXANDER,     | WILBER C. ANDERSON, |
| ANDREW H. DOUGHERTY,     | JOHN ICKLER,        |
| JOHN A. KEMP,            | ROBERT J. LANDON,   |
| ROBERT T. S. LOWELL, jr, | DAVID MUHLFELDER,   |
| LUCAS G. TUTTLE.         |                     |

### INGHAM PRIZE.

ROBERT C. ALEXANDER, West Charlton.

RICHARD D. ANABLE, Springfield, Mass., Honorable Mention,

## WARNER PRIZE.

ROBERT J. LANDON, Schenectady.

## CLARK ESSAY PRIZES IN ENGLISH LITERATURE.

1st, JOHN V. L. PRUYN, jr, Albany.

2d, ROBERT T. S. LOWELL, jr, Schenectady.

## ALLEN ESSAY PRIZES.

1st, JOHN V. L. PRUYN, jr, Albany.

2d, MILES W. VOSBURGH, Albany.

3d, ISAAC G. BURNETT, San Francisco, Cal.

## BLATCHFORD ORATORICAL MEDALS.

1st, ROBERT C. ALEXANDER, West Charlton.

2d, JOHN ICKLER, St. Paul, Minn.

## JUNIOR AND SOPHOMORE ORATORICAL PRIZES.

## Junior,

1st, FRANK E. ABBOTT, Centre Brunswick.

2d, WILLIAM P. WILLIAMS, Aiken, S. C.

## Sophomore,

1st, G. A. P. CODWISE, Grantville, Mass.

2d, EDMUND E. FORD, Schenectady.

## CATHARINE L. WOLFE PRIZES.

## Fellowships.

JAMES E. BENEDICT, South Norwalk, Conn.

JOHN L. FITZGERALD, Brunswick, Ga.

WILBER E. ANDERSON, Le Roy.

ANDREW H. DOUGHERTY, Parkville, Mich.

## For Greatest Improvement in Free-hand Drawing

1st, ROBERT J. LANDON, Schenectady.

2d, DAVID F. GLOVER, South Haven.

## For best Free-hand Drawing.

1st, ANDREW H. DOUGHERTY, Parkville, Mich.

2d, ROBERT J. LANDON, Schenectady.

CLASS OFFICERS, 1880.

President, ROBERT C. ALEXANDER.

Vice-president, WM. J. McNULTY.

Secretary, LUCAS G. TUTTLE.

Treasurer, ISAAC G. BURNETT.

Orator, FRANK P. S. CRANE.

Class Historian, JOHN A. KEMP.

Prophet, ROBERT J. LANDON.

Addresser, JAMES M. McMASTER.

Poet, ANDREW H. DOUGHERTY.

---

NOTT PRIZE SCHOLARSHIP.

Class of 1881.

EDWARD C. JOHNSON, Schenectady.

# SCHOOL OF CIVIL ENGINEERING

OF

UNION COLLEGE.

---

## FACULTY.

PRESIDENT POTTER.

JOHN FOSTER, LL. D.,  
Professor of Natural Philosophy.

JONATHAN PEARSON, A. M.,  
Professor of Botany.

WILLIAM WELLS, LL. D.,  
Professor of Modern Languages and Literature.

MAURICE PERKINS, A. M., M. D.,  
Professor of Chemistry.

CADY STALEY, C. E.,  
Professor of Civil Engineering.

HARRISON E. WEBSTER, A. M.,  
Professor of Natural History.

ISAIAH B. PRICE, C. E.,  
Professor of Mathematics and Adjunct Professor of Physics.

REV. GEORGE ALEXANDER, A. M.,  
Professor of Logic and Rhetoric.

MAJOR J. W. McMURRAY, A. M., U. S. A.,  
Professor of Military Tactics.

EDGAR M. JENKINS,  
Registrar.

## SCHOOL OF CIVIL ENGINEERING.

---

This department was founded in 1845. Its object is to give its students such instruction in the theory and practice of Civil Engineering as will qualify them for immediate usefulness in the field and office in a subordinate capacity and at the same time fit them to fill satisfactorily the higher positions in the profession after a moderate amount of experience in the routine of practice. The course of instruction aims to effect this by constant exercise in mechanical draughting, instrumental field-work and numerical calculation, combined with the study of text-books and lectures on the numerous subjects where books are wanting.

The connection of the Engineering School with the College affords its students peculiar advantages for study in the various departments of the latter, to all of which they are admitted without extra charge.

The location of Schenectady is most favorable for an Engineering School. The city is on the Mohawk river and is intersected by several railroads and the Erie canal. These present many bridges and other works interesting to the Engineering student. There are also extensive Locomotive Works, Machine Shops and Foundries, all of which afford special advantages for examination and study.

### REQUIREMENTS FOR ADMISSION.

Candidates for admission must present testimonials of good moral character and must be at least sixteen years of age.

Examinations for admission take place in presence of three College officers.

The stated times for such examinations will be found in the Calendar. By conforming to these appointments, applicants will



greatly promote their own convenience and interest as well as those of the examiners.

Candidates for the Freshman class will be examined in English Grammar, Modern Geography, Arithmetic, Algebra to Equations of the second degree, and Plane Geometry, five books.

Candidates for any other class will also be examined in all the studies previously pursued by that class.

Students from other colleges, in addition to passing a satisfactory examination, will be required to present a letter of honorable dismissal.

Students may enter at any point of the course for which they are prepared.

Any studies of the course may be taken separately by those qualified to pursue them profitably.

#### EXPENSES.

Students, unless from another College, pay for entrance into the Freshman class, \$5; into the Sophomore class, \$7; into the Junior class, \$9; into the Senior class, \$12.

The College bills for tuition etc. are \$40 per term. They must be paid at the beginning of each term; otherwise the Treasurer will inform the parent or guardian of the delinquency.

The extra charge for the Engineering students in the Laboratory, to comprise the cost of materials used and apparatus broken, varies from \$2 to \$20 per term. A deposit is required.

The price of board in the clubs varies from \$3 to \$4 per week and in private families from \$3 to \$5.

The expenses of instruction, board, lights, washing, text-books etc. during the three terms may vary in amount from \$250 to \$350.

#### TERMS AND VACATIONS.

The course of study is completed in four years. In each year there are three terms and three vacations. Commencement takes place on the fourth Wednesday in June, and the first term begins twelve weeks after that time. The second term follows the Christmas holidays and there is also a brief vacation before the opening of the third term.

## DEGREE.

At the beginning of the last term of the course, students who are candidates for a diploma are required to undergo a written examination on the leading points of all their preceding studies. Those who pass it satisfactorily (and complete similarly the remainder of the course) receive a diploma conferring the degree of Civil Engineer (C. E.); and it is intended that this diploma shall be a guaranty of more than average ability and industry. The others receive certificates proportioned to what they have done both as to quantity and quality.

## SPECIAL STUDENTS.

Those who are not candidates for a degree but desire to study Surveying, Road Engineering or any other special branches of the course can enter as special students and take such studies as they require.

ARCHITECTURAL STUDENTS will find a large part of the course (particularly the Draughting, Mensuration, Stereotomy, Strength and Stability etc.) adapted to their requirements.

## COURSES OF STUDY.

---

### MATHEMATICS.

The studies of this department include the following: Algebra, beginning at equations of the second degree; Geometry, beginning at the sixth book of Davies' Legendre; Trigonometry, plane and spherical; Conic Sections; Analytical Geometry; Descriptive Geometry; Differential and Integral Calculus.

### NATURAL PHILOSOPHY.

The instruction in this department commences with the first term of the Junior year, and extends through two years.

To secure at once precision and fullness, the instruction is mainly given from recently prepared text-books. Frequent lectures are, however, delivered either to furnish illustration and proofs of principles by experiment, or to amplify particular subjects. Thus, after the completion of Statics and Dynamics, several lectures are devoted to mechanical "work," in order that not only the construction and theory, but modes of determining the efficiency, of the various hydraulic and pneumatic machines may be understood. All lectures are required to be written out by the students in full from the notes and submitted for inspection. Numerous problems are also given on all the subjects, and are mostly so constructed that the calculated results may be verified by experiments before the class. To test the accuracy of the knowledge gained, and to insure its ready command, several written examinations are required in each term.

In most of the branches included in this department, the apparatus is sufficient for very complete experimental illustrations; and through the liberality of friends of the College, important additions of French, English and American instruments have been recently made.

The following are the subjects included in the course : Statics, Dynamics, Hydrostatics, Hydrodynamics, Pneumatics, Optics, Acoustics, Heat, Electricity, Magnetism and Galvanism.

#### ASTRONOMY.

The instruction in Astronomy includes Spherical Astronomy, Theory of Astronomical Instruments, and Physical Astronomy.

The students are also given a practical course in Astronomical Surveying and Location, comprising the determination of time, latitude and longitude, and the location of meridians, parallels, great circles and rhumb lines.

#### NATURAL HISTORY.

PHYSIOLOGY is taught in the second Junior term to the whole class by recitations and by lectures on Comparative Anatomy and Physiology. The subjects are illustrated by preparations and dissections.

ZOÖLOGY is taught in the third Junior term by recitations and lectures. The work is illustrated by constant exhibition of specimens and dissections in the class-room.

Instruction in Geology is given during the first term of the Senior year in a series of recitations and lectures, from sixty to seventy in number.

LITHOLOGICAL GEOLOGY. The attention of the student is first directed to a carefully identified series of specimens, and the methods and tests used in identification are given. Then, unnamed specimens are given him, the nature and constitution of which he is expected to determine by comparison and by application of the proper tests.

PALEONTOLOGY. By the examination, on the part of the student of fossils especially characteristic of the principal formations and by lectures, the attempt is made to familiarize the mind with the more important forms of extinct animal and vegetable life. The conditions favorable and unfavorable to the preservation of such forms in the rocks are also considered. Facilities for special study of Paleontology are placed at the disposal of the student without extra charge.

HISTOTICAL GEOLOGY is taught, including the different conditions under which the rock-masses occur, the order of the succession of the formations in time, etc.; also,

DYNAMICAL GEOLOGY. The nature and origin of coal, peat, coral reefs, salt; the action of water in erosion, transportation, etc.; of frozen water, glaciers, icebergs; the various theories of volcanic action; earthquakes and the origin of mountains; metamorphisms; veins, etc.

MINERALOGY is taught during the second Senior term by a course of practical lessons, illustrated by a complete set of models of crystals and a series of six hundred specimens for determination by crystallographic and blow-pipe examination.

BOTANY is taught during the Summer term, both from textbook (Gray's) and practically in the field.

#### CHEMISTRY, MINERALOGY AND METALLURGY.

The recitations in Chemistry extend through two terms. In addition to this, the students receive Laboratory instruction. They are taught by means of qualitative analysis and exercise in the use of the blow-pipe, to determine the constitution of the useful minerals. Their knowledge of these minerals is increased by a course in determinative mineralogy, in which use is made of the celebrated Wheatley Collection, and a complete set of crystal models. As far as practicable, the operations of industrial chemistry are carried out. Students are taught to tin zinc and to gild iron; to electroplate with gold, silver, copper and nickel; to form the various sulpho compounds from pyrites; to burn plaster, lime and cements, and to analyze and test their efficacy; to make and examine the most important alloys; to estimate clays for buildings and fire-brick, and for the manufacture of porcelain; to analyze fuels, slags and fluxes.

The student is required to go through a thorough course in assaying, treating ores of lead, silver, copper, mercury and gold. Attached to the Laboratory is a library of technological books always open to the students for reference.

Detached from the Laboratory is a photographic room, with



skylight, printing-room, etc., and instruction is given by a practical photographer.

### MODERN LANGUAGES.

The modern Languages supply the linguistic training of this course, and are regular daily studies during Freshman, Sophomore and most of the Junior year; one hour a day being given to each class, and the studies alternating according to the schedule.

Instruction is imparted by exercises in translation (written and oral), conversational practice and familiar lectures on the standard authors read.

The French language is a regular study through six terms, beginning with the first term Freshman. The text-book mainly used is Pujol's Complete French Course. At a later period the French dramatists, Racine and Corneille, are read.

The German language extends through six terms, commencing the first term Sophomore. The text-books are Comfort's Grammar, Whitney's Reader and the poets Schiller and Goethe.

In order to familiarize the student with reading French and German scientific works, part of the text-books of the course are in those languages.

### LOGIC, RHETORIC AND ENGLISH LITERATURE.

The instruction in Logic and Rhetoric includes the use of text-books, lectures and practical exercises in oratory and in the various forms of essay. In the study of English Literature, it is the aim to secure an acquaintance with the historical development of the language and with the course of English thought as expressed in different periods in the works of representative men.

The Freshmen have exercises in the elementary forms of Essay, and during the first term Sophomore a text-book on Rhetoric is studied. During the Junior and the Senior year the Rhetorical exercises consist of essays and discussions; and the classics of English Literature and its history are made the subjects of lectures and of study.

Special attention is paid to writing descriptions of engineering projects and of structures and to making reports upon engineering.



## DRAWING AND DESCRIPTIVE GEOMETRY.

The instruction in this department extends through three years.

In the second term Freshman, the student is instructed in the use of drawing instruments and the construction of Geometrical problems: in the first term Sophomore, in Descriptive Geometry (orthographical projection). The drawings of intersections, developments etc., are from Schroeder's models, the Paris Polytechnic School models of intersections and the Olivier models.

In the second term, Spherical Projections; One Plane Descriptive Geometry with drawings from models of Vauban's system of Fortifications; and the application of Descriptive Geometry to Stone Cutting, with drawings from the stereotomy models of the Paris Polytechnic School; Shades and Shadows.

In the third term, conventional colors, free-hand drawing and drawing in plan, elevation and section. The drawings are made from models and from engineering structures.

In the first term of the Junior year, machine drawing; in the second term, oblique projections, including mechanical, military and isometrical projections; in the third term, topographical drawing, comprising methods of representing the relief of ground by contour lines, hatchings and shades from vertical and oblique light, Bardin's models of the various forms of ground being used to illustrate the subject; in the first term of the Senior year, natural perspective; in the second term, architectural drawing.

## ENGINEERING.

The subjects of the course are so arranged as to harmonize with the seasons of the year suitable to field-work or other work. The course includes the following subjects:

**SURVEYING.** Land surveying with chain alone, chain and compass, transit, theodolite, plane-table and solar compass; Mining Surveying; Hydrographical Surveying; Topographical Surveying; Geodetic Surveying, and Astronomical Surveying and Location.

**LEVELING** with the plumb-line level, water level and spirit level; Angular Leveling; and Barometric Leveling.

MENSURATION of engineering structures.

ROAD ENGINEERING, comprising the reconnaissance, location and construction of common roads and railroads; the improvement of the surface of common roads, graveling, McAdamizing, paving, planking etc.; the construction of railroads, including earthwork, mechanic structure, superstructure and equipment.

ENGINEERING STATICS. Statical forces, weights of bodies, fluid pressure, semi-fluids, heat, cold, animal force etc.; dynamical forces, solids in motion, impact, pile-driving, waves, wind etc.

STRENGTH OF MATERIALS. Data and formulas for calculating the resistance of materials to extension, compression, torsion, bending and breaking.

STABILITY OF STRUCTURES. Data and formulas for calculating the resistance of frames, roofs, bridges, retaining walls, arches etc., to giving way by dislocation, overturning, sliding etc.

GENERAL CONSTRUCTION. Materials, foundations, masonry, carpentry etc.

BRIDGE ENGINEERING. Plans and calculations of the forms and dimensions of bridges of wood, iron or stone. A working model of a bridge, in which the strains at various points are shown by a dynamometer, illustrates the identity of the results of theory and experiment.

WATER ENGINEERING. Hydraulic formulas, the supply of water for towns and for irrigation, the removal of water by drainage and sewerage, canals, the improvement of river navigation, harbors, sea-coasts etc.

AGRICULTURAL ENGINEERING.

SANITARY ENGINEERING.

FIELD-WORK. The instruction is made as practical as possible. The students have constant practice in the field whenever the weather will permit. The field-work consists in Land Surveying with the compass and chains etc.; Triangular and Trilinear Surveying and the use of the transit, solar compass and plane table;

Common, Trigonometric and Barometric Leveling and the use of the spirit-level, water-level, theodolite and barometer; Road Engineering, comprising the reconnaissance and location of a line of road, leveling the line, running curves, staking out side-slopes and foundation pits, etc. (a corps for road-engineering being regularly formed, and each student taking in turn the position of flagman, chainman, rodman, leveler and transitman); Astronomical Surveying and Location and the use of the Sextant.

#### VOLUNTARY STUDIES.

Any of the studies of the Classical or of the Scientific course of the College can be taken by the Engineering students without extra charge. Many avail themselves of this opportunity for special study in Ancient Languages, Natural History, Mental and Moral Science, Rhetoric, Logic etc.

#### INSTRUMENTS AND APPARATUS.

This department is fully supplied with field instruments of the best description, comprising Transit, Surveyor's Compass, Prismatic Compass, Burneir's Compass, Solar Compass, Y Levels, the Levels of Troughton, Egault, Lenoir and Burneir; Plane Table, Sextant, Octant, Mountain Barometers, Aneroid Barometer and a Chronometer.

The extensive private collection of models and instruments belonging to the late Professor Gillespie has been purchased for the department, making the entire collection the most complete in the country.

The collection of models in Descriptive Geometry and Stereotomy is very complete. The following are some of the most important:

**THE OLIVIER COLLECTION.** This consists of about fifty models representing the most important and complicated ruled surfaces of descriptive geometry, particularly warped or twisted surfaces. Their directrices are represented by brass bars, straight or curved, to which are attached silk threads representing the elements or successive positions of the generatrices of the sur-

faces. Each of these threads has a weight suspended by it so as always to make it a straight line. These weights are contained in boxes sustaining the directrices and their standards. The bars are movable in various directions, carrying with them the threads still stretched straight by the weights in every position they may take; so that the forms and natures of the surface which they constitute are continually changing, while they always remain ruled surfaces. In this way a plane is transformed into a paraboloid, a cylinder into a hyperboloid, etc.

These models were invented by the late Théodore Olivier, while Professor of Descriptive Geometry at the Conservatoire des Arts et Métiers, in Paris. One set of them is now deposited there, and a second is in the Conservatory of Madrid. Copies of some of them are to be found in most of the polytechnic schools of Germany. The Union College set is the original collection of the inventor, having been made in part by his own hands, and after his death in 1853 retained by his widow till bought from her by Professor Gillespie in 1855. It is more complete than that in the Paris Conservatoire. It may be worth noticing that the silvered plates on the boxes, reading "Inventé par Théodore Olivier," etc., were added by Madame Olivier, after the purchase, at her own expense, as a tribute to the memory of her husband; her own words being, "*Je tenais à ce que chaque instrument portât le nom du savant dont la réputation passera à la postérité.*"

Among the most remarkable peculiarities of these models are their experimental demonstrations of various important theorems of Higher Geometry; as also their suggestion of a close relationship of dissimilar forms, if not their essential identity; since the movements which the various parts admit cause one surface gradually to pass into another as in a dissolving view; so that, for example, a plane is seen to be only a particular case or limit of a hyperbolic paraboloid; a cylinder and a cone to be only extreme cases of a hyperboloid of one sheet, etc. At the same time the singular beauty of form and color which the models



possess arouses the admiration of those entirely ignorant of their mathematical attractions.

Prof. Bardin's (Paris) plaster models (seventy) of the INTERSECTIONS of prisms, pyramids, cylinders, cones etc.

Schroeder's (Darmstadt) models (twenty) of elementary DESCRIPTIVE GEOMETRY. The planes of projection are in wood, and the lines and surfaces in metal; metals illustrating Shades and Shadows.

STONE CUTTING models (twenty) in plaster, selected from those of L'Ecole Polytechnique of Paris.

Prof. Bardin's models (ten) in plaster, of OBLIQUE ARCHES.

Groined and cloistered arch models (ten) in wood and plaster. Models of structures in stone, consisting of bridges, culverts, etc.

Winding-stair models in wood and plaster. Full-sized models of voussoirs and skew-backs of an oblique arch.

MODELS IN TOPOGRAPHY. French and German plaster models giving all the different forms of ground, accompanied by topographical drawings showing how to represent these forms by contour lines, hatchings and shades from vertical and oblique light; models and maps in colored topography; a large model of Mount Cenis Pass, showing the wagon-road and contour lines.

ARCHITECTURE. Models of the five orders of Architecture from L'Ecole des Beaux Arts, Paris; portals; stairs; roofs; walls; buttresses; domes etc.

ENGINEERING. Schroeder's models of joints, brick bonds etc.; spur wheels; bevel wheels; cranes; pile-driver; various forms of water-wheels; pumps; cylinders; valves; eccentrics etc.; steam engines.

Casts of St. Venant's models showing the changes of form in bodies subjected to flexure. Full-sized model of the liquid vein measured by Poncelet and Lesbros.

Models of Bridges on various systems, comprising truss, suspension, tabular and arch bridges; Doyné's Dynamometer Bridge Model, showing by means of a dynamometer strains at different points; models of roof trusses, arranged for using the dynamometer to show the different stresses.

Models of Fortifications, illustrating Vauban's system; shot, shell etc.

Models of Culverts, Piers, Abutments, Culvert Heads, Recess Pool, Wing Walls, Rail Sections etc.

#### PHYSICAL APPARATUS.

The collection of apparatus for illustrating the several branches of Natural Philosophy is very extensive. The latest and best which home and foreign workshops can produce have been procured in order to render the collection as complete as possible.

FOR PRECISE MEASUREMENTS. Steel scales of English and French measures, graduated vessels of various measures and volumes, balances by Becker and other makers, spherometer by Buff and Berger, Wollaston's goniometer, theodolites etc.

#### COLLECTIONS IN THE DEPARTMENT OF CHEMISTRY.

IN MINERALOGY. The Wheatley collection contains nearly 4,000 specimens of minerals, the results of the labors of Charles M. Wheatley. All of these have been labeled according to the nomenclature and order adopted by Dana. They are without exception open at all times to the students. They furnish an admirable means of practical illustration in Mineralogy, the mineralogical recitation room being connected with the large hall. Among the rare and valuable specimens are those of Anglesite, Cerusite, Mimetime and Calcupyrite, which in American specimens are equaled only by those in the British Museum. There are many fine specimens representing the noble metals from all parts of the world. There are few known species of minerals of which the collection does not contain some specimens.

In addition to this there is a large series of unlabeled specimens for crystallographic and blow-pipe examination.

IN METALLURGY. The College possesses a suite of ores of the useful metals comprising over 1,000 specimens. These have been arranged to illustrate their mode of occurrence and geographical distribution. In addition are the fluxes, fuels, etc., used in obtaining the metals from the ores, together with the



slags and metals themselves in various forms. There is a large number of models and drawings of stacks, furnaces, etc.; also suites of specimens of wood, charcoal, mineral coal, peat, etc., both for actual examination and for physical inspection; also specimens of most of the useful alloys.

IN INDUSTRIAL CHEMISTRY. A large number of specimens of the materials used in the manufacture of the mineral and of some of the organic acids; the crude products themselves and the materials used in the manufacture of the alkalies, soaps, matches, black lead, candles, petroleum products, linseed, olive, castor, cotton-seed and other oil, paper, porcelain, glass, fire and building brick, mortar and cements, beet and cane sugars, white lead and other paints, etc., etc.

IN AGRICULTURAL CHEMISTRY. For the study of this branch of chemistry the College has a large suite of specimens of manures, natural and commercial, together with the apparatus for their analysis and also for the analysis of soils.

The Chemical Laboratory is well furnished with apparatus for work, both in analytical and manufacturing chemistry.

#### MAPS, DRAWINGS, ETC.

This collection embraces a large number of maps, plates, profiles, topographical drawings and spherical projections; about fifty thousand engravings, lithographs, photographs, and detail drawings of engineering and architectural structures; working drawings of machines, bridges, buildings, etc.

#### LIBRARY.

The students have the use of the College and Society Libraries. The former contains the Engineering and Scientific Library of the late Prof. Gillespie. A recent endowment of twenty thousand dollars puts the library on an independent foundation, so that it will be kept up with the advance of science.

#### READING ROOM.

The Gillespie Club, a society of engineers, have a reading room well supplied with newspapers, magazines and the principal engineering and scientific journals.

**PHYSICAL CULTURE.**

The students are instructed in military tactics by an officer of the U. S. Army; and a large gymnasium, completely furnished, affords ample opportunities for physical training.

For catalogues or special information, address C. STALEY, Schenectady, N. Y.

# ORDER OF STUDIES.

---

## FRESHMAN CLASS.

### FIRST TERM.

English or Latin.

French Grammar. .... Pujol.

Algebra (continued), to "Series" .... Bourdon.

### SECOND TERM.

English or Latin.

French Grammar and Reader .... Pujol.

Algebra (completed) .... Bourdon.

Drawing — Plane Problems.

### THIRD TERM.

French Grammar and Reader .... Pujol.

Geometry — Books VI to IX. .... Legendre.

Trigonometry — Plane and Spherical .... Price.

Calculations: rapid, accurate and approximate.

English Essay in the third term.

Military Drill three times a week throughout the year.

## SOPHOMORE CLASS.

### FIRST TERM.

French Poetry.

German Grammar .... Comfort.

Descriptive Geometry. .... Church.

Rhetoric .... Hill.

Analytical Geometry .... Olney's Gen. Geom.

### SECOND TERM.

Contemporaneous French Literature.

German Grammar and Reader .... Comfort.

Calculus.

Descriptive Geometry. .... Church.

Mensuration .... Price.

Drawing — Shades and Shadows.

THIRD TERM.

Contemporaneous French Literature.  
 German Reader..... Whitney.  
 Chemistry.  
 Surveying ..... Gillespie.  
 Calculus.  
 English Essays, four during the year.  
 Military Drill three times a week.

JUNIOR CLASS.

FIRST TERM.

German Literature..... Whitney.  
 Mechanics ..... Jackson.  
 Surveying ..... Gillespie.  
 Machines.  
 Chemistry.  
 Logic ..... Jevons.

SECOND TERM.

German Tragedy..... Goethe or Schiller.  
 Electricity, Magnetism, Galvanism..... Foster.  
 Physiology..... Huxley.  
 Analytical Mechanics.  
 Drawing—Oblique projection.

THIRD TERM.

Chemistry..... Cooke.  
 Heat—Steam Engine..... Foster.  
 Strength of Materials..... Gillespie.  
 Zoölogy.  
 Topographical Mapping.  
 English Essays, four during the year.  
 Military Drill or Physical Culture three times a week.

SENIOR CLASS.

FIRST TERM.

Road Engineering..... Gillespie.  
 Geology..... Dana.  
 Optics..... Jackson.  
 Chemistry..... Cooke.  
 Stability of Structures..... Gillespie.

## SECOND TERM.

Engineering Construction.

Astronomy..... White.

Metallurgy.

Ethics and Christian Evidences.

Drawing.

## THIRD TERM.

Physical Laboratory.

Physical Geography.

U. S. Constitution and History.

Law of Contracts and Right of Way.

Botany.

Thesis.

English Essays, four during the year.

Military drill or physical culture three times a week.

# POST-GRADUATE DEPARTMENTS

OF

UNION UNIVERSITY.

---

## ALBANY MEDICAL COLLEGE.

---

The Spring Course for 1880 (devoted to dissecting, laboratory work, clinical lectures at Hospital and lectures on special subjects) begins April 5th and continues eight weeks. No preliminary examination is required for admission to this course. Attendance is optional but urgently advised. The Regular Session begins October 6th and continues twenty weeks. Attendance at this session is necessary for graduation. Degrees are conferred at its end but only after strict examination.

The three-years graded Course is an absolute requirement for graduation.

Fees for first year—Matriculation, \$5 ; Lectures, \$100 ; Dissection, \$10. Fees for second year—Matriculation, \$5 ; Lectures, \$100. Fees for third year—Matriculation, \$5 ; Graduation, \$25. The purchase of a Perpetual Lecture Ticket reduces the total to \$200. Board, etc., may be procured for \$4 a week ; in clubs for less.

The location of the College affords advantages equal to those of any other in the country.

For further information, address

JACOB S. MOSHER, M. D.,

REGISTRAR,

Albany, N. Y.



ALBANY LAW SCHOOL.

---

The first term begins on the first Tuesday of September and continues for twelve weeks; the second begins on the last Tuesday of November and continues fourteen weeks, excepting a fortnight at Christmas; the third begins on the first Tuesday of March and continues twelve weeks. Students can enter at any time.

The Course consists of lectures, examinations, and discussions in moot-court.

The advantages enjoyed at Albany — in the offices of lawyers where many students obtain seats; in the well-chosen working-library of the School and the Law Library of the State; in the sessions of the Supreme Court and of the Court of Appeals (besides many others) presenting all forms of practice and styles of argument — surpass those of any other town of equal size.

The fee for a single term is \$50, payable in advance. The fee for the full course is \$130, payable in advance; and in case of the student's inability to attend both terms of the full course, the amount paid will be in part refunded.

Board, lodging etc. may be procured for \$4 a week; in clubs, for less.

For further information, address

HORACE E. SMITH,  
DEAN OF ALBANY LAW SCHOOL,  
Albany, N. Y.

## DUDLEY OBSERVATORY.

---

Astronomical and Meteorological observations are made regularly with very efficient apparatus.

Instruction will be given to special students.

For further information, address

Prof. LEWIS BOSS,  
DEAN OF THE DUDLEY OBSERVATORY,  
Albany, N. Y.



## GENERAL CATALOGUE AND OBITUARY RECORD.

---

A General Catalogue of the Graduates of Union College, regular and honorary, is prepared from time to time and also an Obituary Record is kept; the yearly additions to the latter being presented at each Commencement meeting of the Alumni.

Graduates are requested to send their address to the College Treasurer for insertion in the General Catalogue; and friends of deceased graduates will confer a favor by sending to the Treasurer or to Prof. Lamoroux a brief notice of the life of the deceased.

---

FORM OF BEQUEST to Union College:—I give, devise and bequeath to the Trustees of Union College, in the town of Schenectady, in the State of New York, the

Most of the present endowments being limited to special objects, the College has the greater need of endowments the income of which may be used "for the general purposes of the institution"; but gifts for any object and of any amount will be very acceptable.



3 0112 105939943

## GENERAL CATALOGUE AND OBITUARY RECORD.

---

A General Catalogue of the Graduates of Union College, regular and honorary, is prepared from time to time and also an Obituary Record is kept; the yearly additions to the latter being presented at each Commencement meeting of the Alumni.

Graduates are requested to send their address to the College Treasurer for insertion in the General Catalogue; and friends of deceased graduates will confer a favor by sending to the Treasurer or to Prof. Lamoroux a brief notice of the life of the deceased.

---

FORM OF BEQUEST to Union College:—I give, devise and bequeath to the Trustees of Union College, in the town of Schenectady, in the State of New York, the

Most of the present endowments being limited to special objects, the College has the greater need of endowments the income of which may be used "for the general purposes of the institution"; but gifts for any object and of any amount will be very acceptable.